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USSR REPORT

RESOURCES

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ELECTRIC POWER AND POWER EQUIPMENT

USSR ENERGY MINISTER ADMITS ACCIDENTS AT NUCLEAR POWER PLANTS

Paris LE MONDE in French 25 Apr 79 p 4

[Text] The Soviet minister of power and electrification, Piotr Neporojny, has admitted for the first time that "several accidents" have occurred in Soviet nuclear power plants, including an explosion and a radioactive leak. This is reported by Robert Michel, cochairman of the American Congressional delegation which has just completed a visit to the Soviet Union.

Mr Michel has stated that two accidents were described to him by the Soviet minister, to convince him that the safety system in use functioned well and could prevent catastrophes. In one case, there was "an explosion that let radioactive steam propagate into other parts of the unit." In the other case, there was a "rupture" of a cooling circuit. The minister did not specify the date or place of these accidents. In both cases, the security enclosures are said to have allowed only a negligible quantity of radioactivity to escape. Mr Neporojny also announced to Mr Michel a proposed Soviet 1,000-megawatt breeder reactor--the equivalent of superphenix, which France is building at Creys-Malville.

(These declarations by the Soviet minister clash with the official published comments: at the time of the Harrisburg accident, the Soviet newspapers considered it impossible in the USSR, and attributed it to "criminal irresponsibility" on the part of the American companies, which try only to make profits. The magazine ACTUALITES SOVIETIQUES recently published an article describing the safety systems of the Soviet reactors and denying the occurrence of "any accident resulting in emission of radioactive wastes." Likewise, "contrary to a tenacious myth," there is not supposed to have been an explosion in 1973 at the shevchenko breeder reactor on the shore of the Caspian Sea. Nevertheless, the Western specialists remain convinced that a violent explosion, of a chemical rather than a nuclear nature, occurred upon the rupture of an exchanger in which molten sodium transfers its heat to steam.)

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CSO: 3100

TIMOFEY IVANOVICH BATUROV

Moscow ELEKTRICHESKIYE STANTSII in Russian No 5, May 79 p 77

/Article commemorating the 70th birthday of T. I. Baturov/

/Text/ Kazakh SSR Minister of Power and Electrification Timofey Ivanovich Baturov, honored power worker, winner of the republic State Prize and CPSU member since 1945, celebrated his 70th birthday in March.

T. I. Baturov was born in 1909 in the village of Sokolovskoye of Krasnoyarskiy Kray, the RSFSR. Timofey Ivanovich began his labor activity in 1936 after graduating from the Novocherkassk Industrial Institute.

From 1936 through 1945 he worked as a foreman at an electric power station, curator engineer for power construction and chief power engineer of the Altaypolimetall Association, and from 1945 through 1962 as chief engineer and manager of Altayenergo.

The qualities of an outstanding organizer, which were displayed by T. I. Baturov, served as the basis for his appointment in 1962 as Kazakh SSR Minister of Power and Electrification.

T. I. Baturov is a highly skilled power engineering specialist and knows thoroughly power management and the questions of the construction and operation of electric power stations and networks.

By persistently attempting to solve the questions of developing the power engineering of Kazakhstan, T. I. Baturov has made a great personal contribution to the creation of the modern power engineering base of the Kazakh republic and to the assurance of the reliable and continuous supply of power to all the sectors of the national economy.

Modern electric power stations have been built in Kazakhstan with the direct participation of T. I. Baturov--the Yermakovskaya GRES with a capacity of 2,400 MW with 300-MW power blocks, the Dzhambulskaya GRES with a capacity of 1,230 MW with 200-MW power blocks, the Irtysh Cascade of GES's and a number of heat and electric power stations. A number of large 500-kV electric power transmission lines, including the latitudinal trans-Kazakhstan 500-kV main electric line running from the Gorno-Altayskaya ASSR to the Urals, have been built, a large amount of work has been done and the electrification of agriculture is being completed with the active personal participation of T. I. Baturov.

The ministry headed by T. I. Baturov completed ahead of time the assignment of the Ninth Five-Year Plan for all the technical and economic indicators and the assumed socialist obligations. The assignments of the 10th Five-Year Plan are being successfully fulfilled.

T. I. Baturov is constantly studying the problems of building the Ekibastuz Fuel and Power Complex.

Timofey Ivanovich combines production activity with much social and political work, is a member of the CC CP of Kazakhstan and a deputy of the Kazakh SSR Supreme Soviet, 6th-9th convocations, is taking an active part in the social life of the collective of the Kazakh SSR Ministry of Power and Electrification, is a member of the party bureau of the ministry and is constantly delivering reports.

By his many years of creative engineering and public activity Timofey Ivanovich has won the respect of the collectives of engineers, which he heads, and his work colleagues.

For services to the Soviet State T. I. Baturov has been awarded the Order of Lenin, the Order of the October Revolution, two Orders of the Labor Red Banner, medals and honorary diplomas of the Kazakh SSR Supreme Soviet.

We wish Timofey Ivanovich Baturov good health and great creative success.

7807
CSO: 1822

ELECTRIC POWER AND POWER EQUIPMENT

LEONID MIKHAYLOVICH VORONIN

Moscow ELEKTRICHESKIYE STANTSII in Russian No 5, May 79 pp 77-78

/Article commemorating the 50th birthday of L. M. Voronin/

/Text/ Leonid Mikhaylovich Voronin, chief engineer of Soyuzatomenergo and candidate of technical sciences, has celebrated his 50th birthday.

L. M. Voronin began his labor activity in atomic power engineering in 1951 after graduating from the Kuybyshev Industrial Institute.

In January 1964 Leonid Mikhaylovich began working at the Novovoronezhskaya AES as chief of the reactor shop, and from October 1965 through March 1970 he worked as chief engineer of the electric power station.

At the Novovoronezhskaya AES L. M. Voronin did much scientific and technical work, which was aimed at increasing the technical and economic indicators of AES's with VVER nuclear reactors and at increasing the reliability of the operation of the equipment and the safety of AES's. The start-up and adjustment work and complete testing, as well as the study of the operating schedules of the equipment and systems in the first and second blocks of the Novovoronezhskaya AES were carried out under his technical direction.

From March 1970 through June 1978 Leonid Mikhaylovich worked as the chief engineer of the Main Administration of Nuclear Electric Power Stations

(Glavatomenergo) of the USSR Ministry of Power and Electrification, and since July 1978 has been working as the chief engineer and first deputy chief of the newly formed Soyuzatomenergo All-Union Industrial Association.

While working as the chief engineer of Glavatomenergo, L. M. Voronin showed himself to be not only a highly skilled specialist in the field of atomic power engineering, but also as an organizer of the extensive introduction of AES's in the electric power engineering of our country. In 1972-1973 the start-up, adjustment and experimental work during the placement into operation of the main block with a VVER-440 series-produced reactor at the Kol'skaya AES was performed under his direct guidance.

During 1975-1976 he took an active part in the work on building and starting up the first large power block with a RBMK-1000 reactor in the USSR Ministry of Power and Electrification at the Kurskaya AES.

For participating in the building of AES's and the development of VVER-440 reactor plants for nuclear electric power stations Leonid Mikhaylovich was awarded the USSR State Prize in 1974 and the Prize of the USSR Council of Ministers in 1978.

For active participation and services in the fulfillment of the plans of the development of the national economy of our country L. M. Voronin has been awarded three Orders of the Labor Red Banner and other awards.

Leonid Mikhaylovich is doing much public work, being the chairman of the sections of nuclear electric power stations in the Scientific and Technical Council of the USSR Ministry of Power and Electrification and in the Scientific and Technical Society of Power Engineering and the Electrical Equipment Industry, as well as a member of the editorial boards of ELEKTRICHESKIYE STANTSII and ENERGETICHESKOYE STROITEL'STVO. Having more than 25 years of work experience in atomic power engineering, he is generously sharing it with his colleagues and young people (through the section of the Znaniye Society).

In congratulating Leonid Mikhaylovich Voronin, we wish him new creative success, good health and happiness.

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CSO: 1822

ELECTRIC POWER AND POWER EQUIPMENT

PRIMORSKAYA GRES CONSTRUCTION DELAYED

Moscow PRAVDA in Russian 30 May 79 p 1

/Article by N. Bratchikov (Primorskiy Kray): "The Start-Up Is Being Postponed Again"/

> /Text/ Many years ago geologists explored the thick seams of lignite in the northern part of Primorskiy Kray. The inexpensive open-pit method of mining it made it possible here to create the main base of power engineering of the Far East. Luchegorsk--a workers' settlement with such a resounding name appeared on the map. It grew along with the coal pit and the buildings of the first electric power station.

The rapid development in the Far East of the fishing, mining, coal and timber industries and agriculture made it incumbent during the 10th Five-Year Plan to worry about the further increase of the power capacities. Although the placement into operation of the units of the first section of the Primorskaya GRES largely filled this gap, it was not able to solve the entire imminent problem. The USSR Ministry of Power and Electrification specified the next stage of the construction project. It was planned to triple the capacity of the Primorskaya GRES. Then it would become the largest from the Transbaykal area to the shores of the Pacific Ocean. An electric bridge should unite it with the Zeyskaya GES. And the unified power circuit of the Far East will be closed.

Such an electric power station is being built here for the first time. The builders have to remove and move 1 million m^3 of earth, assemble 50,000 m^3 of precast reinforced concrete and pour the same amount of monolithic concrete, assemble 18,000 tons of metal structures, install 46,000 tons of various types of equipment and lay more than 5,000 tons of pipelines. Last year the first block was to have begun operating. But, as the brigade leaders and workers of section No 1, which is headed by communist A. Skrylev, have written to PRAVDA, the construction project was in a difficult situation.

The project has not been provided with materials and equipment. For this reason the people are idle. Discipline is being violated, labor productivity is decreasing. Guests from the ministry and the Dal'energostroy Trust frequently visit them and promise to investigate and help. Yet months and years pass, and as always the matter progresses very little.

And here is the result: in the past five years the builders of the Primorskaya GRES have not once coped with the plans. The placement of the important projects of the electric power station into operation is constantly being postponed. An eloquent example is the next power block. The assignment of the first quarter of this year has again not been fulfilled. The equipment is standing idle. The concrete plant and the reinforcement shop are not operating smoothly. Of the projects turned over, including those for cultural and everyday purposes, 70 percent have been accepted with a satisfactory rating.

But are only technical reasons to blame for this? Recently the bureau of the Primorskiy Kray Committee of the CPSU indicated the main reserve which is poorly being taken advantage of at the leading construction project of the kray. It is the inadequate level of the organizing work with people. The party committee is absorbed in petty economic cares and is losing sight of the questions of socialist competition and the promotion of advanced know-how. For example, last year the party committee planned to implement 15 different measures, but managed only 5. Even party meetings at the construction project are held rarely. It is quite natural that the leading role of the party members is not sensed in some brigades and sections of the subcontracting organizations. Moreover, there are one or two of them in each one here, or else none at all.

The Pozharskiy Rayon Committee of the CPSU lost track of this party organization. You look at the documents--the construction project seems to have been in its sight. The questions were discussed quite often both at the meetings of the bureau and at the plenums, but they were not distinguished, as a rule, by a thoroughness of the analysis or a knowledge of the true state of affairs. Perhaps an exception is the examination of the practice of organizing and political work of the party organizations of the first and second sections. The raykom helped them get on their feet. Now the section headed by A. Skrylev regularly overfulfills the plan assignments. Its five multiple-skill brigades have more than once held winning places according to the results of the socialist competition. Many shock workers of communist labor--concrete workers B. Murav'yev, V. Kudryavtsev, A. Koval' and others, who have mastered three specialties each--have appeared here. The competition "A Workers' Relay Race" has developed among the builders. Apparently it is this specific practice of intruding in the work of the local party links which should become the business style not only of the raykom, but also of the construction project headquaters, which was set up in it.

It is justly pointed out in the letter that the production base of the builders, which is located in Spassk, is being developed slowly. Housing

construction per se has been neglected. The formation of the settlement of Luchegorsk as a complete unit has been violated.

The most power-consuming southern rayons of the Primor'ye during the 10th Five-Year Plan should receive additional power precisely by means of the placement of the next blocks of the Primorskaya GRES into operation. The plan of development calls for the building of the heavy-duty Primorskaya GRES-Dal'nevostochnaya electric power transmission line. Its construction must be completed by 1980. However, here, too, very little has been done.

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ELECTRIC POWER AND POWER EQUIPMENT

SOCIALIST OBLIGATIONS OF POWER WORKERS FOR 1979

Moscow ELEKTRICHESKIYE STANTSII in Russian No 5, May 79 pp 2-5

/Article: "Socialist Obligations of the Collectives of the Enterprises and Organizations of the USSR Ministry of Power and Electrification"/

/Text/ The collectives of power workers and power builders, like all the Soviet people, are striving persistently to implement the decisions of the 25th CPSU Congress. Competing for the successful fulfillment of the 1978 assignments, the power workers at the electric power stations of the USSR Ministry of Power and Electrification generated 1,110,700,000,000 kWh. The sale of industrial products was 19,515,500,000 rubles, including 185 million rubles in excess of the plan. An above-plan profit of 113 million rubles was obtained. The specific consumptions of fuel on released electric power were reduced from 334.4 to 331.1 g/kWh, by means of which 2.9 million tons of conventional fuel were saved in the sector.

The power builders put into operation ahead of time power block No 8 with a capacity of 500,000 kW, which is in operation at the Reftinskaya GRES, power blocks with a capacity of 300,000 kW at the Syrdar'inskaya, Iriklinskaya and Stavropol'skaya GRES's, power blocks with a capacity of 210,000 kW at the Surgutskaya and Shaturskaya GRES's, the second power block at the Chernobyl'skaya AES and three hydraulic turbogenerator units with a capacity of 260,000 kW each at the Ingurskaya GES.

The first hydraulic turbogenerator unit of the Sayano-Shushenskaya GES with a capacity of 640,000 kW and the eighth hydraulic turbogenerator unit of the Nurekskaya GES with a capacity of 300,000 kW were put into operation by the Day of the Power Worker.

The first section of the Volgodonsk Atommash Plant for the production of atomic equipment with a capacity of 3 million kW a year has been put into operation.

CC CPSU General Secretary and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev rated highly the labor of the leading collectives in his greetings to the builders, installers and operators of the

Sayano-Shushenskaya and Ingurskaya GES's, the Chernobyl'skaya AES, the 750-kV Vinnitsa-Albertirsa (Hungary) electric power transmission line, the Atommash Plant and the Orenburg Gas Complex--the most important national economic projects, which were put into operation in the third year of the five-year plan. These greetings caused a new surge of creative power in all the collectives of power workers and power builders.

In the vanguard of the socialist competition are the collectives of 18 power systems, electric power stations, plants and construction projects, which were awarded for the successful fulfillment of the 1978 socialist competition Challenge Red Banners of the CC CPSU, the USSR Council of Ministers, the AUCCTU and the Komsomol CC, including: Litovglavenergo, Dneproenergo, Kostromaenergo, the Razdanskaya and Karmanovskaya GRES's, the Kol'skaya AES, TETs-23 of the Moscow Regional Administration of Power System Management, the Yuzhteploenergomontazh, Gidroelektromontazh, Tsentrsel'elektroset'stroy, Nurekgesstroy and Krasnoyarskgesstroy trusts, the Dneproenergostroyindustriya Association and others.

During the fourth year of the 10th Five-Year Plan the power workers and power builders have resolved to consolidate the achieved successes, to compensate for the nonfulfillment of the plan for putting capacities into operation in 1978, to transform 1979 into a year of shock labor, to develop socialist competition for the successful fulfillment of the plan and socialist obligations of the current year and thereby to create the conditions for the successful completion of the five-year plan as a whole.

The socialist competition for the worthy greeting of the 60th anniversary of Lenin's plan of the State Commission for the Electrification of Russia, which coincides in time with the conclusion of the 10th Five-Year Plan, is spreading in the sector. By the day of this anniversary it is planned to increase the total capacity of the electric power stations of the USSR Ministry of Power and Electrification to 248 million kW and the generation of electric power during the year to 1.34-1.38 trillion kWh.

The collectives of the Reftinskaya and Kashirskaya GRES's, the Moscow Elektroshchit Plant and the construction brigades of G. M. Fomenko of the Atommash Plant, of M. P. Mashchenko of the Sayano-Shushenskaya GES and of M. D. Ivchenko of the Chernobyl'skaya AES have come forth with a patriotic initiative on developing socialist competition in the sector.

Following the example of the Leningrad enterprises and organizations, which jointly with builders of the Sayano-Shushenskaya GES are successfully carrying out creative cooperation, which is aimed at reducing the construction period and ensuring a high quality of work, the collective of builders of the Ekibastuzskaya GRES No 1 has organized labor cooperation with 39 machine building enterprises and has adopted for 1979 comprehensive socialist obligations on the early placement into operation of the first two power blocks with a capacity of 500,000 kW each.

In response to the decisions of the November (1978) CC CPSU Plenum and the CC CPSU Appeal to All Voters and Citizens of the Union of Soviet Socialist Republics, in striving for a worthy greeting of the 60th anniversary of the first communist voluntary Saturday, the collectives of workers, engineering and technical personnel and employees of the enterprises and organizations of the USSR Ministry of Power and Electrification are assuming the following socialist obligations for 1979.

In the Area of the Operation of Electric Power Stations and Networks

On the basis of the better use of power capacities, the increase of the reliability of their operation, the dissemination of advanced methods of operating equipment and the shortening of the period of its placement into operation to increase the efficiency of the work of enterprises, to ensure the supply of the national economy with electric and thermal power and the satisfaction of the household needs of the population within the set plan and limits of consumption, for which to generate 1,176,400,000,000 kWh of electric power and 845 million gigacalories of thermal power.

On the basis of the introduction of new equipment, technology of repairs, the improvement of the organization of labor and management to ensure the shortening of the periods of the downtime of equipment for repair as against those stipulated by the plan by 0.9 percent, which will shorten the downtime of one conventional power block on the average by 14.3 hr and will yield a total additional generation of electric power for all repaired power blocks of 327 million kWh.

In order to ensure the more reliable and steady power supply of the national economy with electric and thermal power during the autumn-winter period of 1979-1980 to complete by 15 October with a high quality all the planned capital repairs of power equipment and the preparation of electric power stations for operation under winter conditions.

To achieve in 1979 as compared with 1978 an increase of the coefficient of readiness to bear an electric load of power blocks with a capacity of 500,000 and 800,000 kW by 2 percent, which will promote an increase of the available capacity of electric power stations by more than 150,000 kW.

By means of speeding up the assimilation of the capacities newly put into operation, distributing the electric loads rationally, using advanced methods of operating equipment more extensively and optimizing the operating schedule of electric power stations and networks to achieve specific consumptions of fuel on the released electric power of not more than 329 g/kWh and to ensure as against 1978 a saving of 1.9 million tons of conventional fuel.

To implement measures on the increase of the productivity and the standardization of labor, by means of which to release conditionally 8,000 people for their use at equipment which has newly been put into operation.

To shorten the periods of assimilation of the rated capacity as against the standard periods: of power block No 2 with a capacity of 1 million kW of the Chernobyl'skaya AES by 1 month, power block No 2 with a capacity of 1 million kW of the Kurskaya AES by 15 days, which will afford an opportunity to generate in addition to the assignments at these electric power stations 900 million kWh of electric power.

To fulfill by 22 December the measures on eliminating at thermal electric power stations the gap between the installed and available capacities, which will make it possible to increase the total operating capacity by 1.2 million kW.

By means of increasing the efficiency of power generation to obtain an above-plan profit of 20 million rubles.

In the Area of Capital Construction

To implement steps on concentrating resources at the construction starts of 1979. To aim the efforts of builders and installers at the increase of the production efficiency and quality of construction and installation work, the shortening of the duration of construction of projects, the reduction of the number of unfinished projects, the losses of working time and the downtimes of machines and machinery and the saving of construction materials. To organize the extensive introduction of advanced methods of labor, production and competition--the brigade contract, the initiative of the Sverdlovsk builders "The Five-Year Assignment of the Brigade With Fewer Personnel," the initiative of the Rostov enterprises "Work Without Laggards," as well as the competition under the slogan "A Workers' Relay Race."

By means of the implementation of the enumerated measures to achieve the overfulfillment of the annual plan of construction and installation work for the sector "Electric Power Engineering."

To fulfill the plan of putting power capacities into operation for 1979 in the amount of 14,742,000,000 kW, of them 2.66 million kW ahead of time, including:

a quarter ahead of the set deadline

turbine No 2 with a capacity of 50,000 kW of the Ust'-Ilimskaya TETs;

two months ahead of the set deadline

power block No 9 with a capacity of 500,000 kW of the Reftinskaya GRES;

power block No 8 with a capacity of 300,000 kW of the Iriklinskaya GRES;

power block No 3 with a capacity of 135,000 kW of the Novo-Sterlitamakskaya TETs;

turbine No 5 with a capacity of 50,000 kW of the Permskaya TETs No 14;

the Kurskaya AES-Bryansk 750-kV electric power transmission line;

a month ahead of the set deadline

power block No 10 with a capacity of 210,000 kW of the Surgutskaya GRES;

turbine No 2 with a capacity of 50,000 kW of the Kirishskaya TETs;

turbine No 2 with a capacity of 110,000 kW of the Volgodonskaya TETs No 2;

the Chernobyl'skaya AES-Western Ukraine Substation 750-kV electric power transmission line (the section to the city of Rovno);

by the 62d anniversary of Great October

hydraulic turbogenerator unit No 2 with a capacity of 640,000 kW of the Sayano-Shushenskaya GES;

by the Day of the Power Worker

power block No 2 with a capacity of 410,000 kW of the Armyanskaya AES;

power block No 11 with a capacity of 210,000 kW of the Surgutskaya GRES.

By the 60th anniversary of the first communist voluntary Saturday to put into operation the power capacities at the Ust'-Ilimskaya GES.

Of the total power capacity planned to be placed into operation in 1979 to put into operation not less than 7.5 million kW before 1 November--by the beginning of the maximum autumn-winter loads.

At the construction sites of the most important industrial projects to put into operation by the Day of the Power Worker:

the second section of the Volgodonsk Atommash Plant for the production of atomic equipment with a capacity of 1 million kW a year;

the capacities at the Volga Motor Vehicle Plant for the production of 10,000 passenger cars of greater roadability a year;

the first section of the pulp and paper plant of the Ust'-Ilimsk Timber Industry Complex for the production of 250,000 tons of bleached cellulose a year.

On the occasion of the 30th anniversary of CEMA and for the purpose of intensifying socialist economic integration to ensure by the Day of the Power Worker the fulfillment of all the contract obligations on putting into operation power block No 14 with a capacity of 500,000 kW at the Boxberg

Thermal Electric Power Station and power block No 4 with capacity of 440,000 kW at the Nord Nuclear Electric Power Station in the GDR, power block No 3 with a capacity of 210,000 kW at the Maritsa-Vostok-III Thermal Electric Power Station and power block No 6 with a capacity of 210,000 kW at the Varna Thermal Electric Power Station in Bulgaria, power block No 2 with a capacity of 500,000 kW at the Kozenice Thermal Electric Power Station and the power block with a capacity of 210,000 kW at the Polanec Thermal Electric Power Station in Poland, the power block with a capacity of 210,000 kW at the Kostolac Thermal Electric Power Station in Yugoslavia and power block No 4 with a capacity of 100,000 kW at the Antonio Maseo Thermal Electric Power Station in Cuba.

To ensure the turning over with excellent and good ratings of work quality of not less than 80 percent of the industrial projects, electric power transmission lines and substations, apartment houses and projects for social, cultural and everyday purposes.

To overfulfill the planning assignment on the increase of labor productivity in construction by 0.1 percent, which will make it possible to increase the output for the USSR Ministry of Power and Electrification as a whole to 11,500 rubles.

To perform by the brigade contract method construction and installation work in the amount of 1.5 billion rubles, or 25 percent of the 1979 plan.

Continuing the work on introducing the lump wage payment system, to cover by it not less than 68 percent of the pieceworkers.

To increase as compared with 1978 the level of the standardization of labor of industrial personnel engaged directly in production and to increase it in 1979 to 75 percent, of it according to technical substantiated norms to 92 percent.

To save as against the set rates of consumption of materials in construction an additional 11,000 tons of metal, 29,000 tons of cement and 18,000 m^3 of lumber.

By means of the implementation of measures on improving the use of construction machinery and the increase of the level of its maintenance to ensure the increase of the shift coefficient of construction machinery by 2 percent.

In order to further increase the level of mechanization and automation of construction and installation work to introduce 32 experimental models of new construction machines, machinery, production lines and automation equipment; to decrease the volume of operations performed manually by 2 percent as against the set assignment, for which to deliver to construction projects and to introduce not less than 400 standard sets of mechanized and manual tools.

In the Area of the Production of Industrial Products

By means of the better use of production capacities, the increase of product quality, the implementation of measures on the acceleration of scientific and technical progress, the intensification of the policy of economy, the organization of the smooth operation of plants and repair enterprises, the fulfillment by each collective of the obligations on the shipments of products in conformity with economic contracts in the set products list:

to complete for industry as a whole the fulfillment of the 1979 state plan on the sale of products ahead of time, on 29 December, to produce 20 million rubles of them in excess of the plan, including 300,000 rubles of consumer goods;

to obtain not less than 75 percent of the increase of the volume of industrial production by means of the increase of labor productivity.

To achieve the awarding of the State Seal of Quality to 20 types of items, including the 4A80-4 electric motors, the KS 30-32B and GP 50T gantry cranes, the MRK 690A drilling machine, the V-410 vibratory pile drivers, leakproof valves, electric winches with a lifting capacity of 5 tons, metal poles for electric power transmission lines, heat-insulating materials, high-voltage insulators made of porcelain and glass and reinforced concrete items.

To produce in excess of the plan products of the highest quality category for the sector "Machine Building" worth 5 million rubles and for the sector "Construction Materials Industry" worth 12 million rubles.

To provide the Ekibastuzenergostroy Trust with the early delivery of overhead cranes with a lifting capacity of 50/10 tons during the first six months instead of the third quarter of 1979.

In the Area of Scientific Research, Design, Planning and Surveying Work

The workers of scientific research and experimental design institutes of the power engineering sector will direct their efforts at the implementation of major scientific and technical programs on the development of power engineering, the increase of the efficiency and quality of scientific and planning developments, the introduction in production of new technological processes, equipment and materials, the industrialization of power engineering construction, the development of creative ties of scientific and production collectives following the experience of the 28 Leningrad organizations participating in the construction of the Sayano-Shushenskaya GES, for which they are undertaking:

to fulfill ahead of time, by the Day of the Power Worker, the annual plan on the introduction of new equipment according to all the sections;

to fulfill ahead to time, on 28 December, the plan of planning and surveying work according to the main indicators;

to improve inventing, patent and licensing work, to ensure an increase of the number of inventions by not less than 5 percent as compared with 1978;

to achieve an economic impact from the introduction in production of the results of scientific research in the field of power engineering of not less than 3.5 rubles (as against 3.3 rubles in 1978) per ruble of investments in scientific research work;

to turn over during the year not less than 30 percent of the planning estimates with an excellent rating;

to ensure ahead of time, by 28 August, the issuing of operating documents for the volume of construction and installation work for the construction starts of 1980.

For the purposes of developing creative cooperation with the production collectives to give practical assistance to:

the operators of the Kurskaya and Chernobyl'skaya AES's on bringing up to the design indicators their second power blocks, the Reftinskaya GRES--the eighth power block with a capacity of 500,000 kW, the Zaporozhskaya GRES--three power blocks with a capacity of 800,000 kW;

the operators of the Western Ukraine Substation-Albertirsa 750-kV electric power transmission line on bringing it up to the design indicators;

the workers of enterprises and construction projects in introducing in production inventions and rationalization proposals with an economic impact of 200 million rubles.

By means of the introduction of the achievements of scientific and technical progress and the improvement of layout and design decisions to achieve in 1979 a decrease of the cost of construction by 30 million rubles and labor inputs in construction by 5 million man-days.

In 1979 to fulfill ahead of time and at a high technical level:

the job "The Plan of the Development of the Unified Power System of the USSR for the Period 1981-1985 With Allowance for the Prospect up to 1990" by 27 July;

the technical and economic substantiation of the Chernobyl'skaya AES-Vinnitsa 750-kV electric power transmission line by 24 May;

the engineering plan of the installation of two steam and gas units with a capacity of 250,000 kW at the Surgutskaya GRES-1 by 25 March;

the engineering plan of a standardized building for the Zagorskaya, Kayshyadorskaya and other pumped-storage electric power stations with a head of 100 m by 22 December;

the engineering plan to the Tynda-Prizeyskaya 220-kV electric power transmission line for supplying electric power to the Baykal-Amur Main Rail Line by 25 June;

the engineering and manufacturing plan of the Parabel'-Luginetskaya 220-kV electric power transmission line for supplying electric power to the petroleum and gas deposits of Western Siberia by 1 June.

To draw up on a high technical level:

the engineering plan of the Rzarnowec Nuclear Electric Power Station in Poland;

the engineering plan and blueprints of TETs-4 in the Mongolian People's Republic for the city of Ulaanbaatar for the volume of construction and installation work of 1980;

the general plan of the development of electric power networks of the Socialist Republic of Vietnam for the period up to 1985.

In the Area of the Social Development of the Collectives

For the purposes of implementing the comprehensive plans of the social development of the collectives, which ensure the further improvement of the conditions of the work, daily life and rest of the workers, the reduction of the turnover of personnel at enterprises and construction projects:

to accomplish the early placement into operation of not less than 1,932,000 m^2 of living space;

to put into operation ahead to time projects for social, cultural and general purposes: kindergartens to accommodate 9,230, hospitals with 700 beds, polyclinics for 1,530 visits, general educational schools for 8,340 students, vocational and technical schools for 5,500 students, Pioneer camps and dispensaries.

To ensure during the year the training at courses for the improvement of skills at educational combines of not less than 121,000 new workers, to improve the skills of 414,000 workers and 118,000 engineering and technical personnel.

By introducing advanced forms of trade service at the enterprises of the Main Administration of Workers' Supply, to fulfill the overall plan of the commodity turnover and the output of products of public dining before 30 December 1979, to sell industrial goods and foodstuffs worth 55 million rubles more than were sold in 1978.

To increase the level of the sale of goods by the self-service method to 49 percent.

By means of using the food scraps of public dining enterprises to obtain a weight gain of pork of 1,000 tons.

To put into operation during the year at power engineering enterprises and construction projects 106 dining rooms to seat 17,480, 37 stores with a floor space of 19,090 m^2, 18 vegetable and fruit storehouses with a capacity of 10,460 tons, 3 fermentation and pickling centers for 490 tons, 12 warehouses with a floor space of 26,430 m^2 and 11 refrigerators with a capacity of 2,950 tons.

To reduce the turnover of personnel by 2.1 percent, including not less than 3 percent in construction, 1.2 percent in operation and 1.6 percent in the construction industry.

To fulfill the 1979 assignments of the Comprehensive Plan of the Improvement of the Working Conditions, Labor Safety Procedures and Sanitation Improvement Measures by the Day of the Power Worker.

In Agriculture

To ensure the early placement into operation by the contracting organizations of the USSR Ministry of Power and Electrification of 0.38-20 kV electric power transmission lines for the power systems in the Nonchernozem Zone of the RSFSR in the amount of 25,000 km, as well as 300 km in excess of the plan in Kaluzhskaya, Ivanovskaya, Kostromskaya, Smolenskaya, Kirovskaya and Permskaya oblasts and the Mordovskaya ASSR.

In order to develop further the agricultural production of the Nonchernozem Zone of the RSFSR on the basis of electrification to ensure the early compilation of the planning estimates for 1,250 projects of the zone (electric power transmission lines and substations for livestock complexes and other agricultural projects).

In 1979 to perform in excess of the plan at kolkhozes and sovkhozes work on the repair and the provision of organizational and technical assistance in the operation of electric power networks and electric power substations in the amount of 365,000 rubles.

Before the start of the 1979 harvest campaign to perform at kolkhozes and sovkhozes the repair and to give organizational and technical assistance in the operation of the electric power plants of grain threshing floors, elevators, grain cleaning centers and other agricultural facilities involved in the harvesting of the crop in the amount of 1.9 million rubles.

In the Area of Environmental Protection

To perform construction and installation work on the building of environmental protection projects in the amount of not less than 119 million rubles.

To carry out the repair and modernization of the ash traps of 80 water heaters of thermal electric power stations.

To complete the study and elaboration of recommendations on the designing of a device for the engineering and ecological protection of fish in deep water intakes.

The power workers and power builders will try to see to it that the socialist obligations are fulfilled by each participant in the competition and the personal five-year assignments are fulfilled by the 110th anniversary of the birth of V. I. Lenin.

At the same time they are appealing to the collectives of the associated enterprises and organizations of the Ministry of Power Machine Building, the Ministry of the Electrical Equipment Industry, the Ministry of the Coal Industry, the Ministry of the Gas Industry, the Ministry of Railways, the Ministry of the Chemical Industry and the Ministry of the Petroleum Refining and Petrochemical Industry to fulfill the joint obligations on the set dates, to develop cooperation in work even more actively, which will be a reliable guarantee of the achievement of the ultimate statewide results.

The collectives of power workers and power builders assure the Leninist CPSU Central Committee, the Politburo of the CC CPSU and CC CPSU General Secretary and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev that during the fourth year of the five-year plan they will develop even more actively the drive for the fulfillment and overfulfillment of the plan and socialist obligations, will overcome the difficulties and shortcomings, which are hampering the matter, will eliminate the lag which formed during three years of the five-year plan on some technical and economic indicators, and thereby will create the conditions for the successful completion of the 10th Five-Year Plan as a whole.

The obligations were discussed and adopted at general meetings of the collectives of the enterprises and organizations of the USSR Ministry of Power and Electrification and were approved by the Collegium of the USSR Ministry of Power and Electrification and the Presidium of the CC of the Trade Union of Workers of Electric Power Stations and the Electric Equipment Industry at an expanded meeting on 12 March 1979.

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EFFICIENCY IN ELECTRIC POWER ENGINEERING

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/Article by Candidate of Economic Sciences A. Ya. Avrukh, Institute of Power Engineering imeni G. M. Krzhizhanovskiy: "Steadily Increase the Efficiency of Electric Power Engineering"/

/Text/ The 25th CPSU Congress set as one of the most important tasks of the economy of our country the increase of the efficiency of social production. This is of exceptionally great national economic importance, since it is a necessary condition for the creation of the material and technical base of communism, which has been repeatedly emphasized in the speeches of CC CPSU General Secretary and Chairman of the Presidium of the USSR Supreme Soviet L. I. Brezhnev.

The increase of efficiency should be above all the result of the acceleration of the rate of technical progress and the increase of labor productivity. It should ensure a high growth rate of the national income and be the basis for the successful solution of the diverse economic and social problems facing the country.

The increase of efficiency is of especially great importance for electric power engineering, which is the material base of the building of communism in our country and the basis of technical progress and the modernization of all sectors of the national economy. The development of electric power engineering should promote the acceleration of the rate of modernization and the growth of industry and transportation, the mechanization and electrification of agriculture, as well as the radical improvement of the well-being of the workers. Thus the increase of the efficiency of electric power engineering should affect the increase of the efficiency of the other sectors of the national economy--the consumers of power.

The implementation of the plans of the complete electrification of the country requires very significant capital investments in the building of new power enterprises and the modernization of old ones, as well as great fuel, material and labor expenditures on the production and transportation of power.

The complete and rational use of production capacities and fixed capital, material, labor and financial resources and capital investments is the basis for the increase of the efficiency of electric power engineering. Therefore efficiency is a complex indicator, in which the efficiency of operation and one-time capital investments, as well as the intensity of use of productive capital should be reflected.

In the case of operation the efficiency should be determined by a group of indicators, among which the specific consumption of fuel, the production cost of power, the output of products per ruble of productive capital and the increase of the profit and profitability are of the greatest importance. For illustration it can be indicated that the decrease of the specific consumption of conventional fuel by 1 g and the increase of labor productivity by 1 percent yield an annual saving of expenditures for electric power engineering respectively of 15 and 7 million rubles. However, for all the importance of these indicators they characterize the efficiency of the use of only a portion of the production resources, and not of the entire process of producing and transporting power.

The efficiency of the process of producing power as a whole and the achievable relative economy of fixed production capital, working capital for which standard rates have been laid down, fuel and material expenditures (excluding amortization) and the wage fund can be ascertained by using the indicators of the production cost, the output-capital ratio and the profitability.

Technical progress and the improvement of the technology of the processes of producing and distributing power have a decisive influence on these indicators. The technical and economic indicators of work in electric power engineering are integrally interconnected, since the efficiency of new equipment should receive confirmation in the improvement of the economic indicators.

Both the level of the indicators and the dynamics of the production cost of power, the labor productivity, the output-capital ratio, the profit and the profitability should have a decisive influence on the efficiency of the work of the sector.

The indicators of efficiency are characterized by a great dynamicness and therefore they should be determined for a comparatively long period of time--5-10 years or more. The process of the change of these indicators and their level at different stages of the development of power systems is of considerable economic interest. Moreover, for a proper comparison they should be cited in working conditions comparable to the base period and the value indicators used in the production of resources.

The dynamics of the efficiency of electric power engineering are most graphically evident in the comparison of the main indicators determining it for a lengthy period of time, for example, for 1945-1978. For this it is necessary to eliminate the influence of the increase of prices for fuel, wage rates, the specific cost of a unit of capacity and the rates of amortization, as well as the change in the organizational structure of electric power engineering.

During this period the technical level of power enterprises increased considerably, the heat economy of electric power stations rose sharply. The specific consumption of fuel per released kWh was reduced in 1978 as compared with 1945 by nearly one-half. It should be emphasized that the economy of fuel, apart from decreasing the production cost of power, yields an additional national economic impact by means of the reduction of material, labor and monetary expenditures, as well as of the capital investments in the fuel-producing sectors of industry. A high level of concentration of the production of power has been achieved at large and highly economical thermal electric and hydroelectric power stations.

Labor productivity for the sector during this period increased more than 3-fold, while the production cost of electric power (in comparable prices) decreased to ten-nineteenths. This means that every other kWh of electric power was generated by means of the saved fuel, material, labor and monetary expenditures as compared with the 1945 standards.

The indicators for the future period with a breakdown by five-year periods, as well as for 15-20 years or more, have a great influence of efficiency, since they make it possible to ascertain the main trends of the dynamics of all the indicators determining them for a long period of time.

The determination of the growth indicators by means of their calculation with respect to the enterprises and fixed capital being newly put into operation and according to the products being produced by them is of great importance for verifying the correctness of the design decisions that were made. This should make it possible to check whether the minimization of the adjusted expenditures, which is stipulated in the plans, has been achieved and to compare the actual indicators with the rated indicators.

The dynamics of the production cost of power, the output-capital ratio, the profit and the profitability make it possible to ascertain the cost accounting efficiency of the work of individual power systems and the sector and their contribution to the creation of the national income. It does not coincide with the indicator of the national economic efficiency, which in addition includes the impact from the acceleration of the rate of electrification of the sectors of the national economy and the improvement of the social living conditions of the population of our country.

The reduction of the production cost of power, which is one of the most important qualitative indicators characterizing the degree of economy of the operation of power enterprises, is of great importance for increasing the efficiency of electric power engineering.

The increase of the technical level, the degree of use of capacities and the productive capital of power enterprises, as well as the decrease of the specific consumptions of fuel and the increase of labor productivity are reflected in the production cost.

It is the basis for determining the results of economic activity and one of the criteria of efficiency of new equipment. The decrease of the production cost of power is one of the most important factors of the increase of the profit and the profitability and a source of the further reduction of the rates for electric and thermal power. A decrease of the production cost of power by 1 percent yields an annual economy of 120 million rubles, by means of which an additional capacity of about 1 million kW can be put into operation at thermal electric power stations. The further reductio- of the production cost of power should be provided by means of an increase of the heat economy of the operation of equipment and the reduction of the specific consumptions of fuel, the increase of labor productivity and the utilization rate of the capacity and the reduction of all other material and labor expenditures per unit of output. The entire economically justified impact from technical progress--the use of higher steam parameters, the enlargement of the unit capacity of units, the concentration of the generation of electric power at the large, highly economical KES's /condensation electric power stations/, TETs's and AES's being put into operation, the placement into operation of a number of unique GES's, the increase of the voltage of networks and the creation of territorial associations of power systems--should be completely utilized.

The quickest possible assimilation of the rated efficiencies of equipment and the development of central heating are of substantial importance. The production cost of power can also be reduced by means of the regulation of the payments for quality (the ash and moisture content) and the decrease of losses during the transportation and storage of fuel.

An additional saving for the wage component can be obtained by means of the more complete introduction of the automation and mechanization of the labor-consuming processes of the generation and transportation of power and the scientific organization of labor.

A reduction of the production cost of power can also been achieved by means of a decrease of the component of amortization, the proportion of which is 25 percent of the total production cost of power. This should be the result of the reduction of the proportionate cost of a unit of capicity, the increase of the utilization ratios, as well as the reduction of the rates of amortization for capital repair.

The expenditures on the capital repair of the fixed capital of electric power stations and networks are high and reach 1.3 billion rubles a year. For thermal electric power stations they are equal to half the amount of the annual capital investments.

The reduction of the expenditures on capital repairs can be achieved by means of the lengthening of the operating period of equipment between repairs, the decrease of repeated and emergency repairs, the increase of the quality of the equipment being supplied and the timely elimination of construction and installation flaws. The increase of the quality of repairs and the extensive use of the individual methods of performing them, which

ensures the increase of the labor productivity of repair personnel, as well as the economical use of material and spare parts, should have a substantial influence on the decrease of their cost.

The unity of the process of generating and transporting power is a typical feature of electric power engineering, therefore the efficiency should be determined not only according to the indicators of the degree of economy of the generation of power, but also of its transportation. This is all the more important, since in recent times the cost of transporting power has increased more than 3-fold. This means that the decrease of the production cost of power and the increase of the efficiency of electric power engineering to a considerable extent depend on the radical improvement of the operation of electric power systems, since at present approximately half of all the operating personnel of the power systems and more than 40 percent of all the fixed capital fall to them. This depends above all on the increase of labor productivity, the reduction of the labor expenditures per kWh of electric power being transported and accordingly the decrease of the wage component in its production cost.

In the structure of the personnel of the networks the proportion of line and repair personnel is high and is tending to increase further. A considerable portion of the time of the line personnel of the networks is being spent on periodic preventive inspections of the network facilities, which in many cases are being made without the adequate use of mechanization. The existing level of mechanization of operational and repair work in the electric power networks is inadequate. The centralized servicing of electric power networks and the specialization of personnel by type of activity (current and capital repairs, day-to-day maintenance) and by equipment (line and substation equipment, relaying, communications and so on) should be used extensively.

This should provide an increase of labor productivity and a decrease of the specific number of personnel per unit of adjusted capacity. The automation and tele-automation of the control of the equipment of substations, their conversion to operation without constant maintenance, attendance at home and the maintenance of substations by operational field personnel are of particular importance for decreasing the number of personnel on duty.

A feature of the networks is the great territorial dispersion, which involves increased losses of working time during the journeys of operational and repair personnel, therefore the scientific organization of labor, the elimination of excessive losses of time for travel and the extensive use of the combining of occupations are especially urgent.

The elaboration and implementation of measures on reducing the losses of electric power are of very substantial importance for decreasing the cost of the transportation of power.

The growth rate of the fixed capital of the networks is considerably surpassing the increase of the value of the capital of electric power stations. During 1961-1978 the proportion of the value of the capital of the

networks to the total value of the capital increased from 21 to 44 percent, and there was not less than 1 ruble of capital of the networks for every ruble of the increase of the capital of the electric power stations.

The degree of economy of the operation of electric power networks to a considerable extent depends on the degree of utilization of their fixed capital.

The reduction of the nonproductive expenditures of power enterprises is an important reserve for reducing the production cost. In the reporting only the fines for excessive layover of railroad cars, the losses from the spoilage and theft of materials and others are attributed to nonproductive expenditures. In reality the composition of the nonproductive expenditures is considerably broader and their amount is many times higher. There should also be attributed to them the losses from the nonproductive use of the manpower and equipment of power enterprises, as well as the expenditures on the repeated and emergency repair of the equipment of power enterprises and the losses from wastage for the sectors of the national economy, from the worsening of the quality of the power, for example, in the case of the deviation of the frequency and voltage from the established standard value.

In recent years, in connection with the exclusion from the group of indicators of the national economic plan of the production cost of industrial products, the demands on the method of its calculation have decreased. The method currently in effect does not reflect the specifics of power generation and includes of number of expenditure items not typical of power engineering: "expenditures on the upkeep of equipment," "shop expenses" and others. It is necessary to reorganize the method and system of costing at power enterprises so that the list of costing items would reflect the specific nature of electric power engineering and would ensure their grouping according to the purpose of the expenditures of electric power stations and networks.

The costing of power should be arranged by the technological stages of the generation and transportation of power and the economic elements of the expenditures.

At present for the power systems, in which the centralization of planning and accounting has been carried out, the distribution of all the expenditures of a TETs between the electric and thermal power is accomplished by the "hopscotch" method in proportion to the consumption of conventional fuel. As a result of the use of the "hopscotch" method there was transferred to the production cost of thermal power a portion of the expenses of the machine and electrical shops, which have no direct relation to its generation. This led to the economically unsubstantiated overstatement of the production cost of thermal power (by approximately 10 percent) and the distortion of the efficiency of central heating. At the same time this causes the incorrect calculation of the production cost of electric power, which contradicts the main demand on the costing of products in the USSR--the assurance of the practicability and correctness of reporting data.

It is necessary to reject the "hopscotch" method and fully reinstate the former method of distributing the expenditures of the TETs according to the appropriate types of power.

With the further improvement of the system of the costing of power it is necessary to develop a method of calculating it at nuclear electric power station (particularly with multipurpose generation), at gas turbine and pumped-storage plants, which will be of ever increasing importance in the power balances of the country.

The improvement and further perfection of the method of analyzing the production cost of power are of great importance for increasing the efficiency of electric power engineering. At present its analysis only in comparison with the plan has become widespread. This is inadequately promoting the identification of the internal reserves of power enterprises. Moreover, this can lead to incorrect conclusions about the actual efficiency of the operation of power systems in all those instances when the plan indicators are worse than the estimated (design) indicators, therefore the analysis of the production cost should be made in comparison not only with the plan, but also with the best indicators of former years, with the design data, with similar indicators of the operation of the leading power systems, which are close according to the technical level to the structure of the electric power and fuel balance. The estimation of the the production cost of power only on the basis of the data of current reporting often is not conducive to the determination of its actual value. This pertains above all to structurally complex power systems, in which along with thermal electric power stations there are also hydroelectric power stations, as well as a large amount of purchased electric power from neighboring power systems and block stations.

The individual components of the production cost (fuel, wages, amortization, purchased power and others) are reflected in the indicators of the total production cost in such power systems in a modified form, since they are attributed to the average (compound) kWh. They are thereby detached from the production, technical and economic indicators which determine them. Therefore the data, which is cited in the reporting on the production cost of power, on the economy (overexpenditure) for the individual components according to their value often do not correspond to the actual data of the economy (overexpenditure) of fuel and wages. This confirms the need for a thorough analysis of the production cost of power according to the individual types of electric power stations (condensation electric power stations, heat and electric power stations, hydroelectric power stations and nuclear electric power stations) and according to the individual types of networks.

It is necessary to improve the system of accounting and costing and to use on a broad scale parametric methods of the planning and analysis of the production cost of power. The essence of the parametric method consists in the fact that for electric power engineering, which is characterized by

a high technical level and a great fuel-intensity and capital-output ratio, a direct link can be established between the production engineering indicators and the main components of the production cost of power--fuel, amortization and wages. These components, which reach 94 percent of the total amount of expenditures, can be calculated normatively according to the individual types of electric power stations and the parameters of the equipment on the basis of the design, estimated or actual data on the specific consumptions and prices of the fuel, the utilization ratios and the proportionate cost of a unit of capacity, the amortization rates, the number of personnel and the average wage. The remaining expenditures can be calculated approximately on the basis of the actual or standard data.

The use of the parametric method makes it possible to calculate the production cost of power according to the individual modes of generation or consumption (base, semipeak and peak) and time zones, while the cost of the transportation of power can be calculated depending on the distance from the consumers. This will be the objective basis for the differentiation of the rates for electric power by categories of consumers. Moreover, its use makes it possible to make calculations of the production cost of power:

according to the individual parameters and types of equipment of electric power stations and networks (average, high and increased pressure at electric power stations and voltage in electric power networks), which should be conducive to the determination of the efficiency of the introduction of new equipment;

within broader (as compared with the existing) economic boundaries of power enterprises and power systems with allowance for the expenditures on the upkeep of intersystem electric power transmission lines and the intrasystem and intersystem reserves of capacity;

for the future with allowance for the standard expenditures of the break-in period, as well as the forthcoming expenditures on environmental protection and the economic evaluation of natural resources (land, water and others).

By using the methods of parametric costing, it is possible at electric power stations with different types of equipment to determine the indicators of the production cost of electric power at block, central heating or gas turbine plants, as well as for the individual sections of electric power stations.

As a result of the conducted research by using the parametric method of costing it was established that the production cost of electric power during the period of the maximum load is many times higher than during other months of the year.

The calculation of the production cost of thermal power of different parameters (steam and hot water), which is released to consumers, should be made using it. Here it is necessary to take into account the difference in the

annual number of hours of the use of the capacity, the saving of fuel, as well as the additional expenses for the operation of the heating networks.

Parametric methods should be used especially extensively for the calculation and analysis of the economic indicators of the operation of electric power networks, in which the electric power transmission lines and substations of various parameters--intersystem, main and distributing networks and networks for supplying electric power to agriculture--have been integrated.

Only the average cost of transporting electric or thermal power is determined according to the existing method of costing. The use of parametric methods makes it possible to differentiate the operating costs of electric power networks according to their individual parameters and to determine the cost of transporting power depending on the range and schedule of its delivery.

By making these calculations it was established that:

the cost of transporting electric power, which is released to rural consumers, is nearly 10 times as great as for industrial consumers, while the cost of transporting thermal power in hot water is nearly 8 times more than steam, which is caused by the greater length of the electric and heating networks;

the production cost of peak electric power is several times greater than that of base electric power;

the production cost of electric power, which is released to domestic consumers, is 2-fold more, and for agriculture approximately 3-fold more, than for industrial consumers.

These findings are of fundamental importance for the scientifically sound differentiation of the rates for electric and thermal power by individual categories of consumers.

The parametric methods should be used extensively for calculating other economic indicators of operation--the profit and the profitability. Here modern calculating equipment (computers) should be used extensively, for which a method of calculating the individual indicators and a system of algorithms should be developed.

The high rate of electrification of our country is creating the need for large and ever increasing capital investments in the construction of electric power stations furnished with modern power equipment of new parameters, as well as high-voltage and superhigh-voltage electric power networks and distributing networks of various voltages.

Electric power engineering is one of the most capital-intensive sectors of industry. The value of its productive capital is more than 5 time greater

than the annual operating costs for the generation and transportation of power and is 15 percent of its total value for the industry of the country, so the increase of the efficiency of electric power engineering to a considerable extent depends on the degree of economy of the productive capital and the degree of its utilization, as well as on the indicator of the proportionate cost of a unit of capacity. The degree of economy of power enterprises being newly placed into operation is determined above all by how much better the technical and economic indicators of their operation are as compared with the indicators of operating enterprises.

The decrease of the construction cost is of great national economic importance, since this makes it possible to accelerate the rate of electrification of the national economy of the country with the same capital investments. The lower the proportionate cost of a unit of capacity is, the greater their degree of economy is, all other conditions being equal. The reduction of the proportionate cost is equivalent to the saving of one-time capital investments, since with a lower proportionate cost by means of the same assets it is possible to put a large capacity into operation.

Given the present scale of the development of electric power engineering, the reduction of the construction cost by only 1 percent is equivalent to a saving of 50 million rubles, by means of which an additional capacity at thermal electric power stations of approximately 450,000 kW can be put into operation.

The choice of economical design decisions on the construction and modernization of power enterprises, the improvement of the layout of equipment, the increase of the capacity of units and electric power stations, the improvement of the organization of construction and the utmost increase of its quality, the increase of the level of industrialization, the reduction of the consumption of materials and the cost of construction and installation work, the extensive introduction in the practice of construction of effective materials and structures, the increase of the prefabrication of buildings and structures, the shortening of the construction periods and the timely placement of new production capacities into operation are the main factors of the decrease of the construction cost.

The increase of the utilization and accordingly of the output of products per ruble of productive capital is an important factor which influences the increase of the efficiency of electric power engineering, since this makes it possible to increase the release of electric and thermal power to consumers without additional capital investments. This makes it possible to reduce the proportion of the expenditures being allocated for capital construction and to increase that portion of the national income, which is used for increasing the well-being of the people. The increase of the output-capital ratio also has a substantial influence on the improvement of other technical and teconomic indicators--labor productivity, the production cost of power and the profitability.

The level of the output-capital ratio largely depends on the development and production of new, highly economical equipment, the shortening of the

construction periods, the increase of the proportion of the active capital which participates directly in the generation and transportation of power, as well as the efforts of the operating personnel to assimilate as quickly as possible the rated parameters of operation of the new equipment.

The analysis of the dynamics of the output-capital ratio for the sector showed that in recent years the tendency was observed for it to increase somewhat due to:

the increase of the construction cost and the higher growth rate of the cost of fixed capital as compared with the real increases of production capacities at electric power stations and networks;

the unevenness of the placement of power engineering capacities into operation during the year and the existence of interruptions and limitations of the capacities for projects being newly put into operation;

the slight dispersion of the schedule of electric power loads in connection with the increase of the proportion of electric power consumption of agricultural and nonindustrial consumers;

the considerable increase of the value of the capital of networks and especially rural networks.

An increase of the utilization of productive capital can be achieved by means of the optimization of the development of electric power engineering throughout the country and in individual regions, the shortening of the adjustment periods and the more rapid assimilation of the power blocks of thermal electric power stations, which have been put into operation and are newly being put into operation, the acceleration of the utilization of the capacity of GES's being newly put into operation and the increase of the load of the central heating takeoffs of TETs's, the implementation of measures on eliminating the interruptions and limitations of the capacity, the increase of the number of hours of use of power engineering equipment, particularly by means of the participation of uneconomical equipment for covering the peak loads and the economic stimulation of consumers to concentrate the load schedule of power systems.

It is necessary to focus the attention of the personnel of power enterprises on the implement of measures to increase the utilization of the productive capital, since each percent of the increase of the output-capital ratio is equivalent to a saving of 700 million rubles a year.

Technical progress in electric power engineering in many cases involves an increase of the proportionate cost of a unit of capacity and accordingly a decrease of the output-capital ratio. However, this should be offset by the achievable impact from the reduction of the specific number of personnel, the additional reduction of the specific consumptions of fuel and the production cost of power and the increase of the profitability or by the achievable national economic saving in other sectors.

The profit and the profitability are important synthetic indicators of the work of electric power engineering. The profit characterizes most completely the results of the production operations of power systems.

The economic significance of the profit is governed by the fact that it is the source of financing of capital construction, the formation of economic stimulation funds, settlements with the state budget on the fee for capital and others. During 1968-1977 the monetary savings from the sale of electric and thermal power increased by 70 percent. The amount of profit largely depends on the technological factors and production engineering indicators of operation, as well as on the reduction of the production cost of power, the increase of the output-capital ratio and the decrease of the proportionate cost of a unit of capacity.

The increase of the profit makes it possible to accelerate the rate of expanded reproduction in electric power engineering and vice versa.

The economic basis of the profit is the value of the surplus product which is created at power enterprises. However, for all the importance of the indicators of the amount of monetary savings and the profit, they cannot give a precise idea about the degree of efficiency of the operation of power systems, since their increase can lag as compared with the increase of the generation and sale of power and the value of the productive capital of power systems. Therefore, the profit should be supplemented by the indicator of the profitability by means of the attribution of the planned (actual) amount of savings (profit) to the average annual value of the productive capital. Both indicators are of great importance for characterizing the results of the operation of power systems. The results of the cost accounting activity, as well as the contribution of the power administration to the formation of the net income of the country and to the financing of the expanded reproduction of capital are reflected in the profit. The profitability characterizes the degree of efficiency of their operation.

A shortcoming of the profit and the profitability as indicators which characterize the efficiency of the work of electric power engineering is the influence on their formation of the levels of the rates for electric and thermal power, which fluctuate by power administrations and regions of the country.

The analysis of the work of electric power engineering over the past 10 years showed that, in spite of the high rate of technical progress in electric power engineering, the concentration of the generation of power at highly economical fuel-powered electric power stations and unique hydroelectric power stations and the increase of the quality indicators of its work (a 13-percent reduction of the specific consumptions of fuel, a 60-percent increase of labor productivity, an 8-percent decrease of the cost of generating electric power at fuel-powered electric power stations and an increase of the monetary savings from the sale of power), the profitability decreased both for the sector as a whole and for the majority of power systems. This was caused mainly by the very significant operating costs

and capital investments in connection with the implementation of a major program of electrification of many newly developed regions of the country, particularly Western and Eastern Siberia, the Far East and Kazakhstan. At the same time this produced a large national economic impact, including by means of the development of the productive forces of the new regions and the building of territorial industrial complexes in them.

The need has arisen to further improve the rates for electric and thermal power and to bring them closer to the real indicators of the production cost and capital-output ratio of power.

The additional operating expenses and capital investments on the construction of rural networks, which were transferred to the balance of power systems, the length of which in 1978 had increased more than 30-fold as compared with 1960, had a substantial influence on the decrease of the profitability of electric power engineering.

At present more than half of the operating costs and capital of electric power networks fall to rural networks. In this case the entire impact from the electrification of agriculture is accumulated by the power consumers.

The national economic efficiency of electrification is more extensive than the cost accounting results of the operation of power systems and accordingly the indicators of the profitability of electric power engineering, since it includes, in addition to the intrasectorial saving from the increase of labor productivity, the reduction of the specific consumptions of fuel, the production cost and capital-output ratio of power, also the additional impact from the electrification of the sectors of the national economy.

An additional national economic impact is also achieved by increasing the economic potential of newly developed regions of the countries, as well as by burning low-grade types of fuel at electric power stations. The latter makes it possible to increase the use of high-quality types of fuel in other sectors of the national economy.

A considerable impact was obtained in connection with the increase of the centralization of the supply of electricity from regional power systems to 97 percent of the total consumption of electric power throughout the country. At the same time the proportion of the generation of electric power at small and uneconomical plants of other sectors of the national economy was decreased to less than one-fourth. This made it possible to increase the reliability of the supply of electricity to consumers and yielded in addition a considerable national economic impact by means of the elimination of a large number of local, small and uneconomical power plants. In this case the release of electric power to consumers, whose supply with electricity previously was accomplished from local uneconomical plants, is being carried out by power administrations at rates which are several times lower than the rates previously in effect. This also yielded an additional national economic impact, which was accumulated by power consumers.

The significance of the increase of the national economic efficiency is much greater as compared with the decrease of the profitability of electric power engineering. According to the estimates which have been made, the economic impact alone from the electrification of agriculture from regional power systems reaches 3 billion rubles a year, or half of all the savings of electric power engineering. However, it would be incorrect to compare the national economic and sectorial efficiency, since the latter is the most important component of the overall efficiency.

During the current five-year plan an extensive plan of measures is being implemented on increasing the operating efficiency of power systems by means of the further increase of their technical level and the raising of the indicators of power equipment to the rated indicators, the increase of the utilization ratios of the capacity, the modernization of operating power enterprises, the development and assimilation of new power equipment at TES's, GES's and AES's, the formation of the Unified Power Network of the country, the development of heavy-duty transmissions of superhigh voltage and the increase of labor productivity.

In addition to internal economic factors, national economic factors have a great influence on the increase of the operating efficiency of electric power engineering. Among them are above all the optimization of the structure of the electric power balance and the development of power engineering of the country and, in particular, the concentration of its generation in regions with highly efficient water resources and large reserves of cheap types of fuel. The inexpensive Ekibastuz and Kansk-Achinsk coals, as well as the unique gas deposits in Western Siberia should be used on an extensive scale for generating power.

The national economic factors have the greatest influence on the increase of the efficiency of electric power engineering for a long-term period and are connected with the need to make correct design decisions on the optimum distribution of power capacities and power consumers by regions of the country. This requires a significant increase of the substantiation of the design decisions being made, the effectiveness of which should be determined with allowance for all the expenditures on the upkeep of the networks and the costs of environmental protection.

The impact from optimization will be achieved only on the condition of the assurance of the coordinated development of electric power engineering and the power consumers. Given the substantial gaps in the time of the placement of power capacities into operation and the increase of power consumption, the incomplete utilization of the capital investments which have been made may occur and the optimality of the design decisions will not be realized.

The increase of the efficiency of electric power engineering is a complex national economic problem. Its solution largely depends on the construction and installation organizations, which should ensure the shortening of

the periods and the reduction of the cost of construction of power enterprises, as well as on the power machine building plants.

As is indicated in the speech of L. I. Brezhnev at the November CC CPSU Plenum in 1978: "The policy of efficiency is inseparable from the acceleration of scientific and technical progress."

The most important source of the increase of the efficiency of electric power engineering is technical progress, which should ensure a higher labor productivity than at present, a lower specific consumption of fuel and a lower capital-output ratio and, in the end, a decrease of current and one-time expenditures per unit of products.

Technical progress in electric power engineering at the present stage of its development is characterized by the enlargement of the unit capacity of thermal electric power stations to 4-6 million kW with the installation at them of power blocks with a unit capacity of 500,000 and 800,000 kW and more, the anticipatory rate of construction of nuclear electric power stations with reactors with a unit capacity of 1-1.5 million kW, the increase of the parameters of TETs's, the building of a number of large and highly economical GES's and the placement into operation of a large number of pumped-storage and gas turbine plants.

The new technical parameters show only the potentials of the increase of efficiency. Its achievement requires the extensive and active participation of the personnel of power enterprises in the quickest possible assimilation of the design parameters and indicators of operation. The work of the personnel of power enterprises on implementing of policy of economy in each work place and section should have a decisive role in increasing the efficiency of power generation.

The influence of the personnel on the increase of efficiency is determined above all by the improvement of the production engineering indicators of operation, as well as the decrease of the accident rate and the increase of the reliability of the power supply of consumers. The increase of labor efficiency and the improvement of the ultimate indicators which characterize the results of production--the decrease of the specific consumptions of fuel and the production cost of power, the increase of the output-capital ratio and the profitability and the search for the most effective and economical ways of achieving them--must be placed at the center of all the work of enterprises.

Conclusions

1. The increase of efficiency is the key task of electric power engineering at the present stage of its development. This requires the improvement of the economic indicators of the operation of enterprises, a great efficiency of capital construction and the intensive use of the productive capital.

2. The national economic efficiency is much more extensive than the cost accounting efficiency, which is an integral part and the most important part of it.

3. The increase of efficiency is a complex problem. In the planning estimates the minimum adjusted expenditures are its criterion, while for operating activity it is a group of ultimate indicators: the specific consumption of fuel, the production cost of power, the output per ruble of capital, the profit and the profitability.

4. At the basis of these indicators are the saving of living and embodied labor on the basis of the improvement of the processes of generating and transporting power and the decrease of the fuel, labor, material and monetary outlays per unit of production, as well as the reduction of the capital-output ratio of power.

5. Technical progress, the modernization of power equipment and the intensification of the policy of economy in each work place and section of work are of decisive importance for increasing the efficiency of electric power engineering.

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ELECTRIC POWER AND POWER EQUIPMENT

DEVELOPING THE KANSKO-ACHINSKIY BASIN

Moscow IZVESTIYA in Russian 30 May 79 p 2

[Article by P. Fedirko, First Secretary, Krasnoyarskiy CPSU Kraykom: "Siberian Complex--Experience and Problems in Growth of New Fuel and Energy Base of the Country"]

[Text] The "Guidelines for the Growth of the USSR National Economy in 1976-1980" pay much attention to the Kansko-Achinskiy Fuel and Energy Complex. New confirmation of the great role assigned the KATEK [Kansko-Achinskiy Fuel and Energy Complex] is the recent resolution of the CC CPSU and the USSR Council of Ministers on its establishment.

This attention given to the Siberian complex is understandable. All that is needed is to glance at the array of resources and potentialities the fuel and energy complex has available. Above all, this is the vast Kansko-Achinskiy lignite basin: in it the proven solid fuel reserves alone come to 110 billion tons. Favorable mining and geological conditions make it possible to recover the fuel the cheapest way--open-pit mining--in the amount of up to 350 million tons a year. At this, Krasnoyarskiy coal costs not much more than a ruble a ton--the industry's lowest coal.

The high economic effectiveness of recovery is just what justifies the tremendous outlays allocated for developing the Kansko-Achinskiy basin. And it is important to emphasize that even if the levels of recovery of the mineral from the Kansko-Achinskiy depths are brought to volumes that are three times above the projected levels and then proven reserves will last 100 years, still the KATEK can serve people no less than five centuries.

But serve precisely how? The coal that we are talking about is viewed today largely as a technological fuel. It was decided to construct as part of the complex large thermal power stations and to site, on their basis, heavy-capacity energy-intensive production facilities. Economically, it is best to ship out some of the coal here even to the Kuzbass; this will permit a more rational use of Kuznetsk subsurface wealth for metallurgy's needs and for shipping out to the European part of the country. Dressed, Kansko-Achinskiy fuel is profitably delivered to a number of GRES in

Siberia; electric energy generated here is sufficient for transmitting it westward over extra-high-voltage lines.

And all of this is just the first step in the growth of the KATEK. By 1990 a Yuzhnyy Industrial Center must be set up, with its focus in the city-to-be that will spring up near the settlement of Sharypovo. It will become the base of the complex's future growth. Heavy-capacity power-technology combines for coal processing are proposed to be built in the second stage, along with direct coal firing at thermal power stations. Combine production will be dressed solid fuel, additional electric and thermal energy and feedstock for making liquid motor fuel and for chemical processing.

Our first-priority job is reconstructing the existing pits and building the trailblazer of the Great KATEK--Berezovskiy Mine Number 1. Berezovskoye-One can deliver 55 million tons a year at full capacity. The giant pit is intended for supplying fuel for the Berezovskaya GRES-1. The Berezovskaya GRES will begin generating as much electric energy as the Sayano-Shushenskaya and the Krasnoyarskaya GES combined.

The construction program of the coal giant--the Berezovskoye-One mine--is determined already for the current year at the volume of 10 million rubles; in 1980, as the capacity of the KATEKuglestroy Combine grows, the construction program will quadruple. Fuel is to be delivered at this unique mining enterprise for an electric power station via a 15-kilometer conveyor. Recultivation of the land under the technical project is included at this mine as an immediate integral part of the fuel recovery technology.

The Berezovskaya GRES-1 is also in its own way a unique structure. The boiler unit is 120 meters high. This building can be assembled only with special giant cranes, one of which was already built. The construction trust of the Ministry of Power and Electrification has been set a challenge--to sharply raise the volume of operations. In fact, already by 1983 the first energy block, 800,000 kW in capacity, must go into service, and for this the builders need to carry out work in the volume of 250 million rubles. The challenge is to scale. In the future, new blocks must be placed on line each year.

Included in the energy part of the complex already at the first stage are to be two electric power substations and more than 3000 kilometers of 220 kV and 500 kV power lines. For the first time in world practice it is projected to extend the 1150 kV lines for one and a half thousand kilometers. A vital project of the complex is the Krasnoyarsk Heavy Excavators Plant--its construction is going on at accelerated rates. This is a giant plant, the Siberian Uralmash, and it will provide the coal pits with mammoth machines.

Building and using effectively the vast complex demands the influx of large numbers of people. This means that the necessary conditions must be provided for recruiting and consolidating cadres at the construction projects

of the complex. A sweeping program of stepping up housing and civic construction lies ahead, and--in particular--putting up a new city--the future administrative center of KATEK.

It must be openly admitted: the start of construction of the new city cannot be viewed as successful. True, there was not to be a palace here; we have managed to get along without temporary wooden shelters. But today the requirements are altogether different than five or ten years ago. We view as a grave disadvantage the fact that the pioneer microrayon of the new city is being laid out in an architecturally inexpressive way and with housing of out-of-date series that is unsuitable as to living conditions. But the commissioning of the complex's own house-building combine for 140,000 square meters a day is projected only for 1982. So we believe it worthwhile organizing the production of prefabricated reinforced-concrete for large-panel house construction based on the enterprise of the Ministry of Power and Electrification in the city of Nazarovo.

Heads of several ministries have visited the kray on problems of KATEK's growth: coal industry, power and electrification, railways, transport construction and the construction materials industry, responsible persons from Gosplan and Gossnab USSR, the State Committee for Science and Technology and Gosstroy USSR. On the spot they considered vital questions of carrying through the sweeping program and now we are waiting for the adoption of effective and coordinated measures.

Even today establishments of Moscow, Leningrad, Novosibirsk, Rostov-na-Don, Kiev, Khar'kov, Tomsk and Chelyabinsk are occupied with investigations on problems of the complex. KATEK is a constituent part of the superprogram "Sibir'" of the Siberian Division of the USSR Academy of Sciences.

Interesting developments on the integrated nonwaste energy-chemical technology of processing Kansko-Achinskiy basin coal using magnetohydrodynamic generators are in the hands of a group of scientists at Krasnoyarsk State University jointly with Novosibirskites. We are pinning high hopes on the scientific research and project-design institute on KATEK problems newly founded in Krasnoyarsk. In particular, special attention of all participants in building the complex is merited for problems of environmental protection.

Take as an example, the conservation of natural tracts of land. The giant pits really do take no small amount of pastureland out of circulation. If recultivation is done with old methods, this removal will be very much felt. But the developers proposed laying out the developed space simultaneously with coal recovery. This method promises high returns. But it will be used for the first time and demands special attention in execution. Even more complex are the problems of conserving the air and water basins.

Yes, the developers are working hard to use in their operations all the advances in science and technology available today--special filters,

a closed water supply system and use of ash as raw material for the construction materials industry. However, we must not close our eyes to the fact that all these meausres, given the projected volumes of fuel use, can only limit the effects on the environment, but not block them altogether. Scientists hold that the problems can be radically solved only by converting to the integrated energy-chemical processing of Kansko-Achinskiy coal. Water participates nearly not at all in this process. And the gases produced along with the semicoke can be directed to the magnetohydrodynamic generators. As a result, the release of carbon dioxide to the atmosphere will be cut back by about tenfold. The fossil raw material is to be used nearly without waste. Scientists believe that this is the power engineering of the future. But, let us say again, the scales of KATEK are such that a real need emerges for bringing this future closer as fast as possible and to pass from scientific developments to the practical embodiment of the idea.

Complex problems rise to face transportation organizations. For example, coal shipments even this year on the Krasnoyarsk Railway are going up by 15 percent. And in order to deliver fuel supplied by just the Berezovskoye mine will require each day the loading of about 2500 rail cars. Of course, to deliver fuel within the complex requires using conveyor, pipeline and other modern kinds of transportation. But shipments outside the kray are in fact also growing tremendously. This requires prompt measures in laying new rail lines and developing existing and constructing new rail centers.

Accelerated development of the KATEK agricultural food base holds a special place in the KATEK program. Within the complex, by 1990 the size of the population will reach 700,000 to 800,000, of which 624,000 will live in cities. Party, soviet and agricultural agencies are coming to face the challenge of an appropriate development of agricultural production, particularly in oblasts providing the population with perishable produce, such as milk, eggs, vegetables and potatoes. A higher load will fall on the farms of the Nazarovskiy, Sharypovskiy and Rybinskiy rayons. These are the rayons that require today closer attention--more extensive specialization and concentration of sectors and the supply of materials and equipment to agricultural production. We believe that the leaderships of the Berezovskaya GRES must quickly start with the designing and construction of a total-system fishery.

Construction and operation of the projects in the complex require carrying out a sweeping program of training worker and engineering cadres. Calculations show that by 1983 more than 35,000 persons will be at work here. The equipment used--machines of unique unit capacity and complexity and automation of production processes--presupposes higher cadre qualifications. We expect that the USSR Ministry of the Coal Industry and the USSR Ministry of Power and Electrification can direct to the KATEK projects enough specialists and with this take measures for opening tekhnikumy in Nazarovo and Sharypovo.

The experience approved by the Central Committee of the CPSU in creative scientific-engineering cooperation of the participants in building the Sayano-Shushenskaya hydropower station showed convincingly that socialist competition

is a trusted means of unifying the efforts of the many-thousands-strong collective of scientists, designers, buildings and operators in the name of reaching important final national-economic results. We are trying to apply this experience in full measure and to move ahead in building the KATEK. A special staff headed by the kraykom CPSU secretary has been organized.

Party, soviet, trade union and komsomol agencies of Krasnoyarskiy Kray and labor collectives taking part in building the KATEK are full of resolve to honorably carry out the demanding party and government assignments for erecting in Siberia the large fuel and energy complex that bears vital significance for the whole national economy.

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LENINGRAD COLLECTIVES BUILD SAYANO-SHUSHENSKAYA GES TOGETHER

Moscow PRAVDA in Russian 8 Apr 79 p 1

[Article by Yu. Zakharov: "Cooperation Multiplies Forces"]

[Text] Four years have passed since communist party members of the party group in the Sayano-Shushenskaya GES department of the Lengidroproyekt Institute raised the idea of concluding an agreement on cooperation of participants in building the world's biggest hydropower station in the spurs of the Sayan Mountains. This proposal was backed by 28 Leningrad collectives. They resolved to erect the pearl of power engineering on the Yenisey River on short schedules, with minimum outlays and at a high scientific-engineering level.

The "agreement of the twenty-eight" is a new phrase in the half-century of mass socialist competition. Its characteristic is the combination of individual and collective responsibility of allies for the end results of labor. This is a carefully thought-out document designating the planned and immediate schedules for carrying out assignments; the effect from the contribution of each cooperation participants has been calculated. The network schedule of operations details the program of partner actions for the Yenisey hydropower project; reflected in the network schedule is a full picture of the combined efforts of the collectives--from scientific research to drawings, from models to installation of finished equipment at the construction site.

The advance commissioning of just the first GES facility saved about eight million rubles. More than six million rubles were saved by the use of innovations embodied during equipment development. Add to this the 5000 tons of saved rolled metal stock and reinforcement steel and 9000 tons of cement.

Progress in cooperation and the activity of cooperation participants are continually in the field of view of the Leningrad party organization. And interaction of the collectives is being organized; the course of fulfillment of the general commitments is being monitored by the coordinating council.

"The council includes scientists, specialists and party and economic directors," states the council chairman, Yu. Grigor'yev, director of the Leningrad division of the Gidroproyekt Institute. "The council determines the main tasks for the year and decides on many other questions. On its initiative, a conference--"Effectiveness of Integrated Scientific Research for the Sayano-Shushenskaya GES"--was held. Recently we summed up the results of the four-years' work of cooperation participants, who--by the way--now number 50. During this time workers, engineers and scientists designed and built 15 unique models of hydropower and high-voltage equipment that in many parameters surpass the best world counterpart equipment."

New boundaries to the cooperation of allies will be fortified and built up. The process is moving deep and wide. Contacts are being laid also by those who are building unique equipment and by those who are installing and placing this equipment in service. Direct agreements on competition were concluded by brigades of turbo builders and concrete workers and installers in the Karlovoy line. All this testifies to labor cooperation by its direct participants.

V. Demidenko, brigade leader of installers of Sayano-Shushenskaya GES:

"In preparing for the installation of the impeller of the first hydroturbine, we visited V. Antonov's brigade: they made the facility. Much had been learned about the characteristics of the turbine and its installation. Equipment quality is excellent and the Leningraders rapidly implemented numbers of our observations. Specialists calculated the economic effect from the advance start-up of the first facility. But how to measure the joy of joint labor! Our cooperation became then an excellement school for educating youth."

V. Antonov, brigade leader of fitter-assemblers of the association "Leningrad Metals Plant":

"My comrades are proud of involvement in the great victory of the hydropower builders. We are doing everything for the other machines to enter service ahead of schedules. Not long ago the brigade completed making parts for all ten Sayan facilities."

Time is a strict and impartial judge of the merits originating during the competition. The farfetched beginnings, as shoots without moisture, are doomed to wilting, And conversely, the beginnings that take account of the requirements of the dynamic growth of the economy are assured long life. Such is the "Agreement of the Twenty-Eight." More new collectives are entering the orbit of creative cooperation. The Kama Automotive Plant, Atommash and the Leningrad and Kursk nuclear power stations--these and other shock construction sites became a unique academy of experience in organizing socialist competition for an integrated approach to solving major national-economic problems.

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SMOOTHING PEAK POWER LOAD NONUNIFORMITY WITH USER-REGULATORS

Moscow BYULLETEN' STROITEL'NOY TEKHNIKI in Russian No 2, Feb 1979 pp 24-25

[Article by B. A. Kobyakov, chief, department of power engineering and heat supply of Glavgosekspertiza, Gosstroy USSR, and V. V. Mikhaylov, sector head, VNIPIenergoprom: "User Load Regulators in the Power System"]

[Text] Load plots of power systems are characterized by significant nonuniformity. Thus, at present the difference between the load peak and the night trough in the winter work day in the European zone of the Unified Power System (YeES) of the USSR is 400 million kW, and the rate of load increase in the morning hours is 700 MW per minute.

The capacity of existing GES is inadequate for meeting the nonuniformity of the load in the daily graph and facilities of thermal power stations have to be used. But the load regulation ranges due to the thermal facilities exceed the regulation limits allowable from technical norms. This led to a steep climb in the short-term outages and start-ups of thermal power station facilities in the night hours. Scaling up the energy blocks to 800-1200 MW and the erection of nuclear power stations complicate the situation, since the flexibility of these facilities is significantly lower and involves large fuel outlays. So the question of effective and rational meeting of the load nonuniformity becomes one of the most important problems in power engineering.

This task is technically solvable, but involves significant capital outlays and additional fuel consumption. This is accounted for by the fact that with any technical and economic measures in lowering the outlays in meeting the variable part of the load in the power system, the cost of electric energy, when the load graph is nonuniform, will always be higher than when it is uniform. Therefore, the artificial compression of the load--its equalization--is the more rational way of solving the problem.

Compression of the load graphs of power systems is achieved by regularizing the operation of technological facilities at industrial enterprises, designating installation repair times, setting up reserves of intermediate products for obtaining the possibility of stopping some intermediate parts of technological processes and so on. From the data of Gosenergonadzor [State

Inspection for Industrial Power Engineering and for Power Engineering Supervision], these measures made it possible in 1975 to lower the share of electric energy consumption by enterprises in the maximum consumption period by 3 million kW for the YeES as a whole.

A significant compression of the power system loads is achieved with a special organization of the operation of power-intensive processes in the mode of user-regulators (PR), promoting lowered outlays in the "generation-consumption" of electric energy complex. Significant compression is possible because the operating regime of practically all technological processes can be modified with the appropriate variation in the electric energy consumption. The economic prerequisites of the usefulness of applying the PR mode are determined by the fact that the advantage gained in the power system is greater than the additional outlays by the user when he works in this mode. The economic self-interest of users in the PR mode is achieved by special tariffs on electric energy. These tariffs compensate for user outlays such that their total outlays in the regulation mode (owing to lowered cost of electric energy) become lower than when operation without regulation takes place.

In spite of the increase in fixed assets in enterprises during the PR mode, from national-economic standpoints this situation turns out to be justified, since more efficient use is made of fixed assets in the power category, all the more so in that outlays per kW of generating capacities are several times higher than outlays per kW of PR capacity.

In selecting the PR mode, it is above all necessary to be oriented toward continuous, round-the-clock production facilities with electric energy-intensive processes and a small number of operating personnel and also at automated processes and enterprises. Studies by institutes of the USSR Ministry of Power and Electrification with the involvement of institutes belonging to industries consuming electric energy demonstrated the national-economic effectiveness of several electric energy-intensive production facilities in the capacity of user-regulators of the nonuniformity of the daily graphs of power system loads. Classed with these production facilities are most of the electrothermal installations, plasmochemical installations, pumped-storage, irrigation pump stations, compressor stations, raw material and cement mills, open-cut mines, certain kinds of electrolysis and so on.

Upon examination in the Gosstroy USSR of the technical-economic substantiation and drafts for the construction of industrial enterprises, in several cases it was found expedient to set up reserves of technological capacities for lowering the required electric capacity during the "peak" hours of the power system loads. So Gosstroy USSR sent out to the industrial ministries a letter dated 6 Jul 78, No AB-3003-20/4, in order that the ministries issue directives to the design organizations in setting up the technical-economic substantiation for designing and constructing electric energy-intensive enterprises for developing variants of technological processes of production with different degrees of load in the mode of user-regulator of electric power.

Technical-economic comparisons of variants here must be made based on the sum of the per-unit calculated outlays, guided by a model methodology of determining the economic effectiveness of capital investments, and outlays for electric energy are determined from the tariff providing for payment for participating in the period of maximum power system load.

The VNIPIenergoprom of the USSR Ministry of Power and Electrification drew up methodological materials on selecting user-regulators; Gosenergonadzor confirmed the Directives on Regulating Electric Power Consumption Modes. Application of the user-regulators affords the opportunity of significantly smoothly the load graph of the power systems and reducing the national-economic outlays in the electric energy generation-consumption complex.

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FAST NEUTRON REACTOR NEARING CAPACITY AT BELOYARSKAYA POWER STATION

Moscow PRAVDA in Russian 10 May 79 p 1

[Article by S. Tayns: "Warm-up Is Over"]

> [Text] A challenge is raised in the "Guidelines for the Growth of the USSR National Economy in 1976-1980"--faster construction of fast neutron reactors and bringing them up to design capacity.
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> Rightfully, the Beloyarskaya Nuclear Power Station imeni I. V. Kurchatov is looked on as being an industrial nuclear power laboratory. Scientific and engineering developments are being verified here; experience in operating nuclear power equipment is being gained. Not at all coincidentally, it is this collective that has been entrusted with bringing a fast neutron reactor up to design capacity.

This new reactor of the Beloyarskaya Nuclear Power Station has solid advantages.

A fast neutron reactor can utilize nearly all the natural uranium. The heart of the process is as follows: acted on by fast neutrons from uranium-238 in the reactor there is formed a fissile product--plutonium, which then becomes a nuclear fuel. Natural uranium can then not only "burn", but plutonium can also be reproduced from it.

The third block of the Beloyarskaya Nuclear Power Station, with a 600,000-kW fast reactor, breaks new ground in heavy-capacity nuclear power engineering. Applied in the block is a first-loop arrangement such that the core, pumps and intermediate heat-exchangers are housed in the same building. The practical carrying through of new engineering ideas always involves problems and unexpected turns. To be sure, this made itself felt in the construction schedules. But now the engineering difficulties have been worked out and in 1979 the power block must go into service.

Right now most operations have been shifted from the instrument room to the machine room. The volume of piping in the third reactor loop to be assembled rose sharply. In recounting the status of operations in the complex scheduled to be started up, Beloyarskaya Power Station director V. Malyshev noted:

"The attention and assistance coming from party and soviet agencies are instilling the confidence that the block with the 600,000-kW fast neutron reactor will add energy to the Ural'skaya Energy System as scheduled."

Accompanied by V. Orlov, construction project party organizer, a tour was made along the floors of an enormous cube-shaped building. Finishing work is already winding up in some rooms. The control console room bristled with thousands of multicolored wires awaiting hook-up to monitoring and measuring instruments and to automated control systems. In the building where the reactor is being erected, most of the operations fall on the shoulders of specialists from the Tsentrenergomontazh Trust [State All-Union Installation Trust of the Glavteploenergomontazh of the State Industrial Committee for Power Engineering and Electrification, USSR]. In May they must place the heart of the nuclear power station in warm-up and then assembly three turbines and three steam generators.

"To boost the labor activity of people, we post the competition results daily," said V. Orlov. "And we determine the front-rank workers not from the volume of equipment brought to design capacity, but by the completion of subject-area assignments covered by the network schedule. This way of doing things directs brigade efforts into a common final goal."

Plant operators are even now getting ready to bring the new energy block up to design capacity. Beloyarka veteran E. Sobin, chief specialist on the reactor installation, neatly makes entries in his "Production Diary." He and his associates are reflecting that the erection of a more powerful fast neutron reactor is not a pipe-dream. When its time comes, experience from right now will be to the point. Clearly, without delay the scientific research and industrial engineering departments must engage in generalizing this experience, together with the adjustments, tests and start-up shop. Effective solutions to the problems of reactor building and operation make it desirable to enlist organizations with which agreements on scientific-engineering cooperation have been concluded.

The scheduled volume of construction and installation work last year has been covered. But the state of readiness of some projects is still far from enough. Installation organizations are squandering manpower by trying to bring as much equipment as possible up to design capacity, while the subject-area assignments often fall through. The Uralenergostroy Trust often postpones completion schedules for installing layouts and items needed for sodium acceptance. The Uralelektromontazh Trust delays stepping up operations even though, from preliminary calculations, the trust has to triple the operating rate. The pace of the construction project is limping because of the machine builders of the Podol'sk Plant and the instrument makers of

the Leningrad Elektrosila Production Association, by holding back on equipment deliveries. Orders for the most important complex are not monitored closely enough by the Ministry of Power Machine Building, the Ministry of the Chemical Industry, the Ministry of Chemical and Petroleum Machine Building and the Ministry of the Electrical Equipment Industry.

The warm-up is over. Ahead is the finish line for the builders of the third block of the Beloyarskaya Nuclear Power Station. Concentration of all manpower and resources and the clear-cut coordination of the actions of all areas and subdivisions is the guarantee of carrying through the challenge raised at the 25th CPSU Congress.

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BRIEFS

ROGUNSKAYA GES TUNNEL--The first tunnel was driven into mountains in the area of the Rogunskaya GES in Tadzhikistan. The mountain river of Obigarm will be directed into the 300-meter subterranean corridor. And construction equipment and loaded trucks will travel over sections of the dried channel. This operation made it possible to avoid bringing in three bridges for a short, but tortuous mountain road. The Rogunskaya GES, whose construction was provided for by the decisions of the 25th CPSU Congress, dips into a gorge. In these conditions the construction of auxiliary tunnels is the only way of diverting mountain streams and laying transportation utilities. All told, 60 kilometers of subterranean trunk lines will be tunneled. [Text] [Moscow IZVESTIYA in Russian 24 Apr 79 p 1] 10123

ARMENIA 220 KV LINE--A 220 kV power transmission line has been energized. The line provides reliable power to industrial enterprises in the southeastern part of Armenia and a major agricultural region. [Text] [Moscow IZVESTIYA in Russian 4 May 79 p 2] 10123

YUZHNO-KAZAKHSTAN GRES ABUILDING--Construction of the Yuzhno-Kazakhstanskaya GRES began along the southwest bank of the Balkhash River, not far from the Chigansk railway station. The chief project engineer of this power complex, A. Bychkov, states that eight 500,000 kW energy blocks will be installed at the station. Its reinforced-concrete stack pipes will soar 390 meters above the desert. A 20-kilometer earthen dam will divide part of the lake and from here water will flow for cooling the facilities. Thus, the Balkhash River itself will be protected against water discharging into it that is intended for the needs of the power giant. And the 15-kilometer pipeline and a heavy-capacity pump station are being equipped here for ash transportation. Spoil banks, to which the ash will be sent, will be heaped over with a layerof fertile soil. This will preclude the possibility of dust storms forming during high winds and at the same time permit growing trees and varied grasses in the recultivated tracts. [Text] [Moscow TRUD in Russian 19 May 79 p 1] 10123

OSETIA 220 KV LINE--Ordzhonikidze, 15 May (TASS)--Racing with the clouds, the first poles of a new power "began walking" in the mountains of Northern Osetia. The 220-kilometer 330 kV Ordzhonikidze-Chir-Yurt power route, whose construction the builders have begun, will cross mountain ranges, steep gorges and raging rivers across three autonomous republics. It will bring current of the Chirkeyskaya GES to the unified power system of the northern Caucasus.

The new line will supply energy to cities and workers' settlements, mining, petroleum refining and agricultural centers and will improve power supply of trunk rail lines in a large economic region. Since the start of the five-year plan, three major power lines have been placed in service in the mountains. Today in northern Ossetia all kolkhozes and sovkhozes have been converted to centralized power supply. Another approximately 500 kilometers of power lines remain to be laid in the mountains by the end of 1980. [Text] [Moscow PRAVDA in Russian 16 May 79 p 2] 10123

SOLAR UNIT HEATS WATER--Razdel'naya, Odesskaya Oblast--More than a year ago installers from the Yuzhsel'spetsmontazh Trust installed solar equipment for heating water on the roof of a 12-unit apartment house in the village of Bolgarka. The unit is made up of thin-walled stamped aluminum radiators in the form of panels, totaling 75 square meters in area. Each panel is glass-covered and is oriented so that two-thirds of a sunny day the sun's rays strike it, heating water to 70-80 degrees; the water is then sent to the apartments. In the basement of the apartment house is a boiler room; in the autumn and winter months it is switched on. The solar unit on the apartment house roof recouped its cost in just one and a half seasons. The spring sun now provides hot water to the residents free of charge. [Text] [Kiev RABOCHAYA GAZETA in Russian 25 May 79 p 2] 10123

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MOSCOW'S POWER-CONSERVATION PROBLEMS DISCUSSED

Moscow GORODSKOYE KHOZYAYSTVO MOSKVY in Russian No 5, May 79 pp 26-27

[Article by T. Andreyev: "The High Price of the Kilowatt-Hour"]

[Text] The Central Control Room [TsDU] of the Unified Power System [YeES] of the Soviet Union is located on the 38th floor of a large nonresidential building in the very center of Moscow. The vast oval-shaped hall has been equipped with a control panel for a vast, large-scale operation that includes about 800 electric-power stations, hundreds of electrical transmission lines of various potentials--from 220 to 750 kilovolts, and a multitude of substations.

Compact electronic apparatus, which is mounted at a semicircular table, operates silently and, to an unskilled person, even imperceptibly. It allows on-duty controllers to constantly follow the state of affairs in the power-management regions, that is to say, to keep their hand on the pulse of the Unified Power System. At any time one can be connected up here with the Ukraine or the Caucasus, the Urals or North Kazakhstan, or Karelia or Arkhangel'skaya Oblast, over special channels.

As a rule, the senior controller begins the shift with communication with the Mosenergo [Moscow Regional Administration of Power System Management] Control Center in order to clarify whether there are any breaks in the capital's power supply. This is not surprising: Moscow is the largest customer, its share being 13 percent of the power generated by the unified system. And a forecast indicates that this share will grow annually. Industrial facilities and housing tracts are being put into use, the lighting network for streets and squares is being expanded, there is an ever-increasing number of kind helpers--household electrical applicances--in the Muscovites' housing, and the policy of replacing gas ranges with electrical ranges has been undertaken. How do they get along here without "subsidies"?

"It must be noted, however," says TsDU YeES Chief Controller V. T. Kalita, "that the Mosenergo system includes the electric-power stations not of just the capital but also its suburbs and adjacent oblasts, and it makes a solid contribution to the nationwide electric-power supply."

On the wall in front of the controllers is a diagrammatic map of impressive size. Each electric-power region has its own place. Moscow, which is included in the Tsentr Association, has been surrounded with substations, and it is evident that dozens of power-transmission lines converge on and emanate from here. This means that Moscow receives and sends out electricity at the same time. The capital, moreover, is a transit point on the path of various power flows. In particular, it transmits power to the Urals and Siberia and to the country's northern and western regions.

The red flashing of a square blinker means an alarm: there is damage on the line.

"It is much quieter in Moscow in the summer," continues Vasiliy Tikhonovich. "In the first place, power consumption is down. Second, the weather does not bring special concerns. Unless the lighting from a thunderstorm damages the power line. But fall and winter are more complicated."

An especially tense situation is created at the control panel when there are glare ice and a strong wind somewhere. The fact is that the wire becomes very heavy from the icy growth. When the wind strikes it stretches, and when the wind subsides it drops, which sometimes lead to a partial interruption of the line. The electricians call this "the dance of the wires." Even actual breaks occur. Then the emergency service acts responsively in the field. Once many troubles plagued the Volgograd-Moscow line. Because of the "dance of the wires," it was inactive a total of 15 minutes.

In the control-panel area an enormous barometer display attracts attention. "Clear," "cold," "rain," and "sunny" have been written against the names of the various geographical zones. The temperature also has been indicated. It turns out that, in making up an optimal operating regime for the power regions, it is necessary to consider the weather forecast for each day. In Moscow, for example, an overcast summer day requires an additional 0.5 million kilowatt-hours--in other words, enough electricity to supply four of the capital's subways.

In a conversation with V. T. Kalita I reminded him about the case when New York was left for almost a day without electric power, and I asked if such a thing can happen to us, particularly in Moscow.

"The unified system," he answered, "in which an unprecedented number of low-level and regional power systems operate in parallel will prevent the situation in which New York found itself. Let us suppose the impossible: Moscow's entire power base has gone out of operation. But plants and factories will continue to operate and lights will burn in Muscovites' homes. Because the interconnection of all the electric-power lines of the unified system permits us to switch additional power sources to the capital instantly."

...And now we are at the Central Control Panel of Mosenergo. Let's have an interview with Chief Controller V. Ya. Ovcharek.

"It's actually like this: the TsDU of the unified system pays much attention to Moscow," he says. "In any case, we cannot complain. It was cold at the end of December and the start of January. During those days we received a solid addition to our own power resources from the unified system--it can be said that Moscow did not experience a severe power shortage."

"But nevertheless, there were cases where various housing tracts were without lights for a while...."

"You're right. In some areas cables and transformers did not withstand the colossal overload and went out of operation. But the damage was eliminated fairly quickly.

"I want to note," adds Valeriy Yakovlevich, "that on those unusually cold days workers of rayon divisions of Mosenergosbyt [Mosenergo Marketing Office] held meetings in the zheks [housing-operations offices] and cautioned people against overindulgence in the use of various electrical heating appliances. However, this produced little effect."

Well, surely, unexpectedly severe cold justifies extraordinary electrical consumption to some extent. But the harm is in the fact that during ordinary Moscow weather there are no few kilowatt-hour wasters. And this provokes anxiety on the part of Mosenergosbyt Chief Engineer A. S. Poznukhov.

It was not possible to speak with Aleksey Sergeyevich at once. He had visitors in his office, and the conversation with them was loud in tone at times. The telephone rang incessantly. But finally, having found a minute, Poznukhov began the conversation:

"No, just think about what precious worktime is being spent on! I have been compelled all day long to ward off pushy applicants. They phone endlessly, and they come and try to prove something, and they demand and become indignant. And all of them with a single purpose--for no other purpose than to get an increase in their organizations' ceiling on electricity. And where do we get it if it is distributed with precision by facility? I cannot do one of them a big favor at the expense of another."

The applicants whom Poznukhov speaks about represent organizations that Mosenergosbyt calls rather sharply but correctly, "overindulgers." They often overexpend the daily ceiling on electricity, they suddenly remember it--more often than not this happens at the end of the month, and they begin to solicit additional kilowatts.

Mosenergosbyt makes a daily accounting for electric-power consumption of the largest and most active consumers--about 300 of them. You glance at a special journal and at once it is evident who overindulges. For 28 days in January, for instance, in first place in violating the ceilings stood

the Northern Water Pipeline Station, then followed the wood-fiberboard combine of Glavmospromstroymaterialy [Main Administration of the Industry for Building Materials and Constructional Parts of the Moscow City Soviet], the Electric-Lighting Equipment Plant imeni Yablochkov, the Moscow Fats Combine, the Parizhskaya Kommuna footwear factory of the Zarya production association, the Vostryakovskiy Reinforced-Concrete Structure Plant, and others.

But if Mosenergosbyt can monitor the large consumers, and that means it can punish the "overindulgers," by reducing their ceilings, then what about all the other organizations that do not have ceilings? For example, various institutions and stores, public-dining enterprises and housing? Indeed, there will not be enough special equipment or monitors to look them over constantly.

"You have not seen such a scene," continues Aleksey Sergeyevich. "The builders turn over a facility and they warm the walls, which are not yet dry from the whitewashing, with 500-watt bulbs, not just for an hour or two but for days. Or another example. Frequently, because everyday amenities for workers have not been arranged at construction sites, they burn reflector heating lamps and spiral heaters of some kind of unusual design in their mobile housing. Not units but hundreds of thousands of kilowatt-hours are thus expended....About 2 years ago the Moslift [Moscow Elevator] Association proposed to introduce a very valuable rationalizer's suggestion. It would enable the lighting of elevator shafts to be regulated. But no more was heard about it, and everywhere these shafts are being illuminated round the clock. The same can be said about the entrances and staircases of housing and administration buildings. And not long ago we rode on Volgogradskiy Prospekt at 0200 in the morning. Not a soul was around but the streetlights were burning on both sides of the arterial. Half of them could be quietly turned off.

"The lighting design of some street advertising," says Aleksey Sergeyevich, "or of store windows, by the way, has been made uninterestingly, and at times costs more than the lighting of a five-story apartment house. And it worries no one. And how many lights are not turned off at daybreak in departments and laboratories, and in auditoriums and classrooms, and everywhere that a thriftless attitude toward such a great blessing as electricity reigns. And indeed the price of a kilowatt-hour of electricity is great. There is a unit of measurement known as the kilogram-meter. Here is what it is. One kilowatt-hour is equivalent to 36,760 kilogram-meters. Further. A kilowatt-hour is 330 grams of standard fuel equivalent. And so it is that, if each Moscow apartment would save 5 kilowatt-hours per month, this would save more than 4 tons of fuel. It turns out that this blessing--electricity--is expensive if one approaches it from the standpoint of the state. And each resident of the capital must remember this at work and at home."

...One can understand A. S. Poznukhov's agitation. And the editorial board shares his concern about the reasons for the negligent attitude of various organizations and people toward electricity. However, I would

like to hear about what kind of measures that Mosenergosbyt is taking to stop instances of the squandering of electricity. It is difficult, of course, to maintain constant and rigid monitoring over every store and institution. But perhaps spot checking can be performed more strictly? Let's say, if repeated warnings about the necessity for a more thrifty attitude toward energy does not help, then do not limit yourself to disconnecting the facility from the power supply but impose a penalty against it. It is up to the competent authorities to decide just what to do.

And have you landed in this situation? A young woman of severe aspect appears with notebook in hand at your apartment. Having written down the readings of the household meter, she strictly pronounces: "Comrade, you have not paid for the use of electricity. The arrears must be paid up."

It's no use to take offense at this young woman: she is doing her official duty. But now just think: what if she had the authority to say, in effect: "You are using far too much electricity. Is it justified? Perhaps you are making irrational use of electrical appliances, or they are not properly adjusted. They must be checked."

Of course, all this is supposition. How, as a matter of fact, to deal with wasters of electricity, how they should be called to order--this is not a question of one day, but it requires a joint approach. Clearly, there is only one thing: one can in no way put the solving of this question away on the shelf.

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MAJOR AREAS FOR CUTTING FUEL, ENERGY WASTE PROPOSED

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 3, 1979 pp 60-66

[Report of a "Round Table" discussion conducted by M. Kaganskiy: "The Customer Must Use Fuel and Energy Without Losses"]

> [Text] Fuel and energy are our riches. How to use and extract them more wisely so that each kilogram of coal, each kilowatt-hour of electricity and each kilogram-calorie of heat energy will produce the greatest yield--the journal's editorial board posed these questions to a number of specialists who are occupied with problems of the rational and economical use of fuel and energy resources.
>
> Representatives of USSR Gosplan, managers of the energy services of some ministries and agencies, and scientific-institute workers were gathered about the "Round Table."

The Strategy of Thriftiness

A. Nekrasov, division chief of USSR Gosplan: The Soviet Union, as is known, meets its fuel and energy requirements completely through its own natural resources. However, the underground wealth is not limitless, and an expansion of its use will lead to a depletion of nature's storehouses. But extraction of this wealth is being developed increasingly intensively. Half of the total of this extraction in 100 years has occurred in the past 10 years in the case of natural gas, 14 years for oil, and 33 years for coal. The thrifty handling of the underground stores is becoming one of the most important tasks of the state and a job for each Soviet citizen. Of course there are many routes to savings. But it is important to identify the main ones, the so-called global trends, and to develop a strategy for rational natural-resources utilization. And such a program, naturally, is being developed in our planning organization.

The Main Directions for Developing the National Economy During 1976-1980 lays down a strategy for growth in the fuel and energy industry that is

oriented toward a rational combining of the various types of fuel and the large-scale use, along with oil and gas, of coal, shale, water power and nuclear energy.

However economically we act with regard to fossil types of fuel, their natural reserves will be reduced. Because of this, the global strategic trend is to replace these traditional types of fuel with others. Thus, an increase in the generation of power at GES's and nuclear electric-power stations will reduce mineral-fuel requirements considerably. In 1975, for example, the AES's saved about 4.5 million tons of standard fuel equivalent, and in 1980 the experts hypothesize that savings will about quintuple.

Beyond the Tenth Five-Year Plan, the development of district heating will be based increasingly upon nuclear energy and upon other sources of energy and the methods for obtaining it. Such types of energy as geothermal and solar have already come out of the laboratory and are in the industrial-test stage of assimilation. The energy of weakly heated heat-carriers--ventilation-air discharges, effluents of industrial enterprises and municipal aeration stations, heat from burning household trash, and so on--is being used increasingly widely. For example, in Dagestan and in certain other regions, hot-springs water is going to the hot-water supply and the heating of greenhouses. The forecast reserves for such heat sources have been appraised at 25-30 million cubic meters per day, on the whole.

Solar energy is already being used in solar-energy installations that are linked up with boilers at Simferopol', in Uzbekistan and Turkmenistan, and in Odesskaya, Kiev and Moscow oblasts. Larger installations for heating housing are being erected in Tashkentskaya Oblast, at Tbilisi and so on. In Uzbekistan the industrial production of solar-engineering equipment has started. Fifty thousand square meters of solar heaters and 25,000 solar kitchens, whose use will enable 10,000 tons of standard fuel equivalent to be saved per year, are to be produced during the year. And these are but the first steps.

Undoubtedly, use of the new heat sources will not in any way eliminate the problem of the rational use of the older, traditional sources. The strictest savings regime is required here. And the potential for this is enormous. It is true that the reserves that are lying on the surface have practically been exhausted. And, as calculations indicate, measures for saving fossil fuel will require capital investment that averages 60 rubles per ton. But according to preliminary estimates, almost twice as much capital investment is required for extracting and transporting the fuel. Thus, it turns out that it is much cheaper to save than to produce.

This calculation can be sited: saving just 1 ton of fuel in generating each kilowatt-hour of electricity for the country as a whole is equivalent to the release of 1.5 million tons of coal for other purposes.

A. Sal'nikov, chief specialist of USSR Gosplan: The 25th CPSU Congress planned to provide in 1980 for a reduction of 3-4 percent in the

consumption norm for boiler-furnace fuel and of 5 percent for electricity and heat energy. Let's take a look at a realistic price for these indices: a 1-percent saving of boiler-furnace fuel is enough to melt 16 million tons of pig iron or more than 70 million tons of open-hearth steel; a 1-percent saving in electrical power is enough to extract about 30 million tons of coal or more than 32 million tons of petroleum; and a 1-percent saving of heat energy is enough to produce more than 1 million tons of chemical fiber or 10 million tons of ammonia.

The savings in electricity contemplated for the five-year plan is equivalent to the annual generation of about 17 hydroelectric-power stations like the Dneproges [Dnepr Hydroelectric-Power Plant] imeni V. I. Lenin and to the annual production of boiler-furnance fuel of more than 11 large mines.

A. Gorshkov, senior scientific worker of the All-Union Heat-Engineering Institute imeni Dzerzhinskiy and doctor of engineering sciences: I think that one of the strategic trends in the rational use of heat-engineering resources is correlation of the level of development of fuel production with the prospects for developing electric-power stations and other sources of energy. Thus, the lag in the opening and reconstruction of various underground and strip mines makes it necessary to ship coal from remote places of mining, to convert electric-power stations from one type of fuel to another, which requires great additional expense and stimulates losses of capacity in the reequipping of boilers, and so on.

With the development of electric-power stations, all the accompanying construction of electric-power and heating grids and other items must be coordinated. Right now the deadlines for assimilating new power units are often stretched out because of the delivery of poor-quality or incomplete power equipment and because of construction and installing work deficiencies. Highly economical heat-and-power centrals could not in some cases use their district-heating capacity completely because the heating networks and heat users were not ready. This often resulted from orders for pipe for heating networks not being satisfied in full measure.

N. Gromov, section manager of the Academy of Municipal Services imeni K. D. Pamfilov: During the discussion a definite tendency has appeared: all the speakers have talked basically about ways to save fuel in industry. But, on the other hand, the workers of the enterprises live in cities, towns and settlements, there is an agency housing inventory here, and the problems of municipal and everyday services also should be resolved.

A bit of information: about one-fourth of all the solid and gaseous fuel produced in the country is expended in supplying heat for housing and social buildings in the country's cities, towns and settlements. And the quantity thereof will grow continuously, since the norms for living space per person and the comfortableness of housing are being raised. And this means additional expenditures of energy and fuel. And so a strategic trend should also be generated here. Apparently, USSR Gosplan should

make up a 10-15 year plan for the heat supply for large cities based upon master plans for development that consider the resources that can be allocated for these purposes. Such a plan must single out the sources of heat (TETs's and large boilers), the developers, the types of fuel, the basic equipment, and so on.

We are justifiably delighted about the attractive social buildings, the large, broad windows. The so-called "aquariums," whose walls are made almost completely of glass, are being built ever more frequently. They are excellent in appearance. But their heat losses are 2-2.5 times those of ordinary buildings. In analyzing wall structure, the operating expenditures for heating also must be considered. Housing towers must also be examined from a heat-engineering point of view—they also play a role here. In our view, more rigid norms should be established for heat conduction. It would seem that it is not so complicated to increase the tightness of window openings against air infiltration by installing hermetic seals.

Optimization of the regime for heating buildings is needed. A completely comfortable temperature for rooms is from 18-20 degrees C (where there is normal insulation of windows and doors). During night hours the temperature in the premises of housing, and of social buildings on nonworking days), can be reduced without harm.

Heat sources, pipelines, heating outlets and local systems for heating and hot-water supply in buildings constitute a single system with a common regime for the generation, transport and consumption of heat. Apparently it would be wiser from a technological and economic-organization standpoint to operate such a system as a single organization.

Such an organization should be a city association and it should service all sources of heat (except the TETs's) and the heating networks and heating outlets. It will be easier for this large organization to establish mechanized bases and to obtain mechanisms and equipment and the materials necessary for repair work and servicing.

A most progressive form of organizing the heating activity in the republics are the oblast production associations, which include the operating organizations of cities, which enjoy the rights of enterprises, and those of towns and villages, which enjoy the rights of departments. Such associations can have specialized services in all areas of their activity, especially for repair and rebuilding.

Such experience has been accumulated, for example, in Stavropol'skiy Kray and Zaporozhskaya Oblast.

In our view, it is useful to create within republics production-type design and scientific associations that will be able to provide for the development and practical introduction of measures for technical progress in the heat-supply activity of municipal services.

The principle of planning the activity of heat-supply operations enterprises ought to be reviewed. It is better that the main indicator of their activity be not the generation of a certain amount of heat and the sale thereof but the normal provisioning of heat to the customers at minimum fuel cost. A material incentive must be provided to all personnel to save fuel (naturally, with the mandatory observance of all the standards for supplying heat to buildings).

The brigade method, under which a contract (for a year) for servicing is transmitted to a brigade that services, let's say, a boilerhouse, heating networks, heating outlets and local systems in buildings, could yield the greatest combining of the interests of the state and of operating personnel to save fuel. The brigade is provided with fuel and the materials for current repair and operation. If, by improving operations, fuel is saved (in comparison with the past period or with the norms), it is desirable to spend a part of the funds saved on bonuses if, of course, the normal heat supply for the buildings has been provided (if the standard temperature is maintained in the premises, a certain amount of hot water is furnished for domestic needs; and so on).

Zeal Is the Law for All

A. Nekrasov: The conversation has touched on the long term. And this is natural. Without clearly and precisely defined goals, it is impossible to develop even a tactic for saving or conduct current operations.

What are the main ways to save fuel and energy today? What needs attention in order that a barrier against losses may be erected? It would seem that the first stage of such a barrier is the all-around prevention in every possible way of losses of fuel during its production and of electricity during its generation. The second is improvement in every possible way of the use of fuel and power resources in the sphere of consuming for production purposes. One worker engaged in the production sphere expends an estimated average, based upon Donets coal, of 12.5 tons of standard fuel equivalent per year. Therefore, if each worker saves as much as 1 percent of this at his workplace, then the whole national economy will be able to operate for 3-4 days on the fuel saved.

One of the effective ways is the use of secondary resources and of waste heat. Last year the heat-energy requirements of the enterprises of a number of branches of the economy were covered to a great extent by the use of heat from waste gases, hot water and steam. At the same time, there were still many losses thereof--an estimated million tons of standard fuel equivalent. More than a billion cubic meters of blast-furnace gas is consumed in flares at metallurgical enterprises.

The housing and municipal services are a major sphere of consumption of energy resources. And here each person can and should take part in the drive to save fuel and energy. For there are still great losses of heat and power here also.

S. Veselov, chief of Gosenergonadzor [State Inspectorate for Industrial Power Engineering and for Power-Engineering Supervision] of USSR Minenergo [Ministry of Power and Electrification]: I can give specific figures on losses to the national economy. In 1978 Gosenergonadzor inspectors investigated the enterprises of 40 ministries and agencies. And here is what they found. Losses of electricity exceeded 1 billion kilowatt-hours, and losses of heat energy were more than 6 million kilogram-calories.

To advocate the effective use of energy resources without accurate accounting for each section is like scooping water with a sieve. Daily accounting for the consumption of fuel and raw materials and substantiated consumption norms are needed.

Strict monitoring over the expenditure of energy resources, not only plantwide, enterprisewide and construction-project wide, but also in every department, section and element, is being maintained at progressive enterprises. It is a well-established matter, for example, in Kemerovo's Azot production association.

In accordance with the approved norms, each production facility and department receives an individual ceiling on electricity. A plan for organizational and technical measures for 1978-1980 has been worked out under which 46 million kilowatt-hours of electricity are to be saved.

Or the Southern Machine-Building Plant. A system of material responsibility for the irrational use of energy resources is in operation here. A coupon for violations is prepared by workers of the chief power engineer's section and handed to the department chief. The plant's chief power engineer determines the material damage caused the plant in accordance with the coupons and the written reports of the department chiefs about eliminating the deficiencies that had been discovered and about the persons at fault. And then an order about punishment of the guilty is issued, and the cost of the damage inflicted is exacted from them.

The Statute on Organization of the Work to Save Electricity, Heat, Fuel, Water, Coolness and Compressed Air is in effect at Dzerzhinsk's Kaprolaktam production association. The document governs the obligations of all workers and social organizations to save energy resources, and a system of indicators and a summing up of operating results have been developed that will enable the status and results to be objectively evaluated, positive experience to be disseminated, and steps to be taken quickly against those guilty of extravagance.

However, not by far is this going on everywhere. At many enterprises consumption is being determined by eyeball. Special measuring instruments are needed. For reporting about electricity there is an inadequacy of instruments, but still there are some, but there are no heat-measuring instruments at all.

This prevents reliable accounting, and, consequently, the setting of substantiated consumption standards. In many ministries the ceiling on

electricity has been established per estimated 1,000 rubles of products produced. But, as they say, not all thousands are alike. It is one thing, let's say, for children's socks, but it is another for expensive appliances. Their price is high but their energy consumption is comparatively low. Thus conditions are created for a fictitious saving and, as a result, also for squandering energy.

When the collective will report accurately the amount of resources that have been released to it and will know that it will have to account for each kilowatt-hour, kilogram-calorie and cubic meter of gas received, then concern about saving will at once acquire concreteness and activeness.

A. Vasil'yev, chief operating engineer of the Administration of the Chief Power Engineer of Minneftepром [Ministry of Petroleum Industry]: Undoubtedly, the setting of standards is one of the chief questions. In order to solve savings tasks successfully, the planned amount of expenditures for fuel, heat and electricity must be known precisely. And it is desirable that it be established not in a gross amount, as is being done frequently now, but per unit of output. Only in this case can effective monitoring be established over the correct use of fuel and energy resources.

Success in the rational use of fuel and energy depends in no small degree upon the creation of a consumption-norm structure that is uniform for all enterprises, the main purpose of which is to put order into accounting and reporting.

However, a standards base still is being created slowly. One of the causes, in our opinion, lies in the fact that poorly-qualified specialists are engaged in questions of setting norms. Especially at the enterprises. But indeed there is a large number of specialized organizations--territorial scientific-research institutes, central scientific-research laboratories and norm-setting research stations. They must be involved more widely for these purposes.

A. Sal'nikov: The norms are one of the active tools for saving. Right now the Basic Regulations for Setting Consumption Norms for Fuel, Heat Energy and Electricity, which have been in effect since 1966, are being reviewed. They lag far behind the modern requirements of the national economy that are imposed upon both the methodology and the organization of norm-setting for fuel and power resources in production work.

With the issuance of the new Basic Regulations, it will become necessary to examine the methodology of the approach to consumption-norm setting in the ministries and departments. This work is large in volume and it requires the participation of many highly qualified specialists of ministries, agencies and branch-of-industry institutes that are engaged in questions of raising the utilization effectiveness of fuel and energy resources.

In this connection, USSR ministries and agencies and Union-republic gosplans must do substantial preparatory work today so that the examination

and refinement of the existing procedures and directives of the branches of the economy will be organized in the shortest possible times.

But it is not just a matter of norms and the setting of standards. There are many fairly good enactments and regulations and other documents whose instructions are not being carried out.

An investigation conducted by scientists of the Moscow Management Institute imeni S. Ordzhonikidze at certain machine-building industry enterprises that work on a 5-day schedule indicated that gas is being expended on nonwork days in amounts too large to be justified either by engineering or economic considerations. And the cause is the fact that the monthly gas ceiling is distributed to these enterprises by the gas-supplying organizations for a 7-day schedule, that is, in accordance with the calendar days of the month.

And what does this lead to? Since the ceilings are established on the basis of actual gas consumption for the reporting period, enterprises strive artificially to raise it, in order to avoid a reduction of the ceilings for working days (indeed, on nonworking days gas expenditure drops, and that means that the average level is reduced). They try to expend the established gas ceiling uniformly over the week by maintaining the gas-consuming industrial equipment in a so-called hot reserve. Or on nonworking days they generate additional heat not occasioned by production needs.

If the equipment is stopped on nonworking days, then certainly the ceiling on consumption is overexpended correspondingly on working days, while maintaining the monthly and quarterly ceilings of the enterprise creates externally, as a rule, a deceptive picture of well-being.

At the same time, when there rare sharp cold spells, the gas-supplying organizations do not meet the enterprises' requirements for gas above the daily ceiling. In this case the supplier bears practically no responsibility, since the enterprises, by exceeding the established daily ceiling for gas consumption, are deprived of the opportunity to present an official complaint.

Such cases of overconsumption of gas are characteristic for enterprises of all branches of the national economy that operate on a 5-day schedule.

It would seem that it would be desirable and economically justified to distribute quarterly ceilings on gas for enterprises by months and by days to take into account the number of workers and not the calendar days of the plan period.

This proposal is in agreement also with the rules of the existing Regulations for Delivering Gas that were approved by decree of Gosarbitrazh [State Arbitration Commission] under the USSR Council of Ministers, dated 31 July 1961, which states: "In case it is necessary to deviate from the average daily norms, gas should be consumed in accordance with a

controller's schedule that has been coordinated between the parties." Unfortunately, gas-supplying organizations violate this important point (maintaining the uniformity of gas consumption is evaluated positively).

S. Veselov: This is true. Our inspectors have observed that in many cases losses of energy resources are not objective in nature and occur as a result of elementary slipshodness and nonobservance of the directives, specifications and operating conditions and regimes. According to our specialists' calculations, if all these regulatory documents had been observed in the industries that were investigated, more than 2 billion kilowatt hours of electrical energy and 11.5 million kilogram-calories of heat energy would be saved. And neither any additional investment nor any kind of organizational measures are needed to realize such powerful reserves.

Many workers of the energy-engineering services have developed, I would say, a kind of scornful attitude toward the directives. They forget that such documents incorporate, as a rule, advanced collective experience. They indicate how and in what regime energy-consuming units should operate.

One need not go far for examples. This winter stood out as unusually severe. They say that it has not been as cold for 100 years. This, evidently, opened the eyes of certain executives. They had considered that they could get by without appropriate preparations for cold spells. The result, sadly, is well known. The -40 degree cold of December caused the strongest condensation of cold air on power units, as a result of which boilers went out of operation at a number of electric-power stations and TETs's.

What kind of supereffective organizational and technical measures are needed here? Just the strict observance of operating discipline, a high state of organization, and an economical and a civic-spirited approach to the assigned mission.

Such negligence costs the state and all of us severely. Lights left on for no good reason, whistling steam pipes, the idle running of machine tools--what kind of measures are needed here? As a matter of information, leakage of processed air reaches 50 percent.

The most important point is that hardly anyone answers for such wastefulness. One cannot make material demands on a worker for a machine tool that is not turned off (and this happens very often). It would seem to be possible to make demands on a supervisor for squandering heat. But the existing system of penalties is cumbersome and not effective. Our inspectors present the reports of their checks to the administrative commissions of the local soviets. The enterprise manager, especially of a large enterprise, is, as a rule, a deputy of this soviet. And the matter runs into obstacles: what is there, he says, to scold his worker for?

Apparently it is time to put an end to such energy poaching by creating the appropriate legislation.

Levers for Saving

A. Gorshkov: Something must also be done about prices. In our view, price-setting is not considered, or is poorly considered, as a factor in the rational use of fuel and energy resources. Yet it plays an extremely important role in this matter. Definite engineering and other steps must be taken to save fuel. However, the prices for fuel, heat and energy do not stimulate them. While prices for fuel and energy resources are unchanged, the allowances for one-time expenditures on measures have been increased by 25 percent. Apparently, an incentive coefficient of effectiveness should be introduced.

Rates for heat and prices for energy are too low. And this leads to squandering, and the measures taken to save during construction and during the operation of industrial and municipal structures turn out to be unwarranted.

But yet prices for prototypes of steam generators, turbines and other machinery are set extremely high. Therefore, difficulties arise in introducing new equipment.

An important factor in saving is a rise in the quality of energy-producing fuel during the extraction process. The combustion heat of coal is being reduced from year to year, and the ash increases. This causes increased wear on power equipment and an increase in the amount of repair and overhaul work, and it reduces productivity and the operating economy of electric-power stations. For example, the ash content of Ekibastuz coal exceeds 50 percent. But the miners are not motivated to raise the coal's quality, since gross output is given an incentive without a consideration of the valuable-component content. The discounts from prices for fuel for deterioration in its quality that exist today motivate neither the suppliers nor the mining organizations. The economic mechanism for evaluating the miners' activity, it is our deep conviction, is out of date and needs review.

S. Veselov: It is true. The existing system for prices and rates aids the irrational use of fuel and energy. The price levels are extremely low; they were set long ago and need review. According to USSR TsSU [Central Statistical Administration] data, in 1976 the share of expenditures for the cost of energy and fuel was, within the structure of expenditures for producing industrial products, about 6.1 percent. Naturally, economists do not pay attention to such an insignificant item of expense. This does not by far stimulate savings.

Moreover, managers who prefer not to trouble themselves with efforts to discover reserves still are not extinct. It is simpler, of course, to operate when the standards do not put you in a bind, when there is no strict demand for their observance. This means that a system of stimulation and material responsibility that will economically impel economic managers to be zealous is needed.

In our view, the rates for energy for industry should be increased sharply. And the amount of penalties also. Let them exceed the cost of the energy by several times. The penalty for bus and trolley "hares" [ticketless riders] exceeds the nominal cost of a ticket by 20-25 times. It seems that this will be effective and will not require expenditures.

Because It's Worthless Doesn't Mean It's Free

A. Vasil'yev: Undoubtedly each branch of the economy has its specifics, which are also reflected in the structure of energy consumption and in the actual potential for savings.

A characteristic feature of our system of ministries is the fact that there is a large number of territorially dispersed small-scale customers for heat who are distant from communities. Therefore, lots of small, in-house stationary boilerhouses have to be built, mobile installations are used, and so on. And about 40 percent of the fuel consumed is burned in such industrial-production boilerhouses.

The main heat-carrier at the installations is steam. About 80 percent of the requirement for heat energy is satisfied by that means. But more than half of the boilers do not have economizers, as a result of which there are great losses. Calculations indicate that replacement of the existing units by more economical ones will not, unlike other branches of the economy, produce a benefit within the Minnefteprom [Ministry of Petroleum Industry] system--expenditures on the equipment will be too great, and that means also long periods for recoupment.

What measures can actively reduce specific fuel consumption in the ministry's industrial boilers?

The main direction here is to save steam by collecting and returning condensate from the users and by using the heat of transit steam and boil-up steam. At present, for the ministry as a whole, 4.6 million tons of superheated condensate are dumped, that is, the annual heat losses are 870,000 kilogram-calories. Right now the level of return of condensate is 40 percent. As a maximum, it is technically possible (and economically desirable) to raise it by 1½ times. This will raise boiler efficiency by 1 percent. The conversion of boilers from liquid fuel to gas yields as much. It is something of an achievement to raise the KPD [efficiency] by 2 percent. And as a whole the annual savings therefrom for the ministry is 190,000 tons of standard fuel equivalent.

Facilities for collecting and returning condensate with schemes for the stepped-up use of transit steam and of secondary boil-up steam must be built. However, this matter is still advancing slowly. The enterprises have not been motivated to build such stations. And the cause here, in our view, is the fact that the methodology for computing the economic effectiveness of measures for saving heat energy is incorrect. Right now only the direct cost of the fuel is considered, and the additional expenditures that would have to be borne in order to obtain its equivalent

quantity, that is, the cost of building boilerhouses and the operating costs disappear from view. Meanwhile, such a methodological error leads to great miscalculations in plans. Under the obsolete procedure, the period of the enterprise's recoupment through savings is 5 years. Under the new method, which considers the capital investment that would be required for erecting additional boilerhouses, the period of recoupment turns out to be less than 2 years.

A major energy increment is utilization of the heat of the waste gases in heat-exchange apparatus that is intended for preheating chemically purified water. It is delivered to feed boilers to make up for condensate that is not returned. The additional fuel consumption for preheating the water is precluded. Calculations indicate that savings from this exceed 80,000 tons. The cost of the heating installation is repaid in just about 3.3 years, and it is 1/16th of what replacement with new boilers would cost. The introduction of such installations raises boiler efficiency by 2 percent.

The heavy-duty engines of gas pipeline-pumping units consume about one-third of the fuel. The main heat losses here are discharges of exhaust gases into the environment. Utilization equipment is necessary. The use of secondary resources instead of full-fledged fuel for preheating the oil in arterial oil pipelines can yield a saving of more than 50,000 tons annually.

I. Khotsinskiy, deputy chief of the Administration of the Chief Mechanical Engineer and Chief Power Engineer of USSR Minpishcheprom [Ministry of Food Industry]: It was correctly noted here that many enterprises pay little attention to the use of condensate. In our branch, heat losses reach 10-15 percent because of this.

Secondary energy sources are a powerful reserve for augmenting the fuel arsenal. According to rough estimates, for example, in the fats and oils industry it is possible to satisfy half of the enterprises' requirements for heat with them in this subbranch of the industry. Good experience has been gained also at sugar plants. Thus, at the Krasnopresnenskiy Sugar Refinery the heat of the condensate that is returned to the TETs power system is used for preheating water that is used for process needs and partially for heating housing. Secondary steam of the collector of condensate from the vacuum-apparatus heating chambers is used to heat water in the heating system for auxiliary departments.

Exhaust-gas heat can be of great assistance. Today, for the branch as a whole, 200,000 tons of standard fuel equivalent per year departs along with it to the wind. The question is not new, it has already been raised more than once, but the problem with the VTI [All-Union Heat-Engineering Institute imeni F. E. Dzerzhinskiy] type of cast-iron economizers that should be used for such purposes still has not been resolved. Only new boilers are being outfitted with these installations. But there are many old units at our enterprises. What is to be done with them? I think that not just food-industry workers are being harmed but also some other branches of the economy.

An economizer costs 8,000-10,000 rubles and it can save 4-5 percent of the fuel. So it is not difficult to calculate what the lack of such installations costs the state.

All these measures require definite capital expense. But there are still enough reserves that require (and this has already been discussed) only an ordinary degree of organization. Luminaries get covered with dust, dirt and steam condensate. This leads to a sharp reduction in illumination--to one-eighth to one-tenth as much. As a rule, they start putting in additional bulbs instead of wiping the existing ones. But at the Krasnopresnenskiy Sugar Refinery the light at workplaces is measured periodically and old luminaries are replaced by more economical ones. The electricity saved thereby is about 12 percent of the total amount consumed.

A simple measure is the replacement of the ordinary incandescent bulbs with fluorescent bulbs of equivalent power. This permits the illumination level to be raised by 2-3 times, and this means a saving of electricity.

Similar "little" items of saving can bring much to any enterprise. The compilation and, naturally, the observance of a schedule for turning lighting fixtures on and off, let's say. Daylight hours, the area's level of illumination, and the installed capacity are known. All the parameters of the light-flux level can be determined fairly accurately with this information.

Overconsumption of electricity occurs also because of voltage fluctuations in the grid. A reduction of it by about 1 percent, for example, will cause a reduction in the light flux of incandescent bulbs by 3-4 percent and of fluorescent bulbs by 1.5 percent. Meanwhile, industry produces fairly reliable voltage limiters and regulators and other devices.

A. Kasatkin, director of the Tsentroenergotsvetmet production association of USSR Mintsvetmet [Ministry of Nonferrous Metallurgy]: I can confirm this. Methods for regulating the voltage in lighting networks by means of thyristor voltage limiters are effective. Serial production of TON-3-220-63 type devices, the design of which has been awarded the State Emblem of Quality, has already been arranged. Now a new, still more effective instrument, the TON-3-220-100 is being mastered. Its introduction into industry will yield a saving of more than 30 million kilowatt-hours per year.

There are great opportunities also for the use of secondary energy resources in our branch of industry. Thus, during many processes exhaust-gas temperatures exceed 1,000 degrees. Calculations indicate that 60 percent of the requirement of, let's say, the copper subbranch, for heat energy theoretically can be covered through secondary resources. Experience has been gained in utilizing superheated gases from reverberatory furnaces. This heat is used in heat-recovery boilers of various designs. The annual output of heat per unit installed at a metallurgical furnace is 25,000 kilogram-calories, and the average productivity is 7-8 tons of steam per hour.

The aluminum subbranch is the most intensive user of electricity. Right now more than 17,000 kilowatt-hours of electricity are expended for each ton of the winged metal. The use of more improved electrolytic reduction cells and the optimization of operating regimes--these are realistic ways to save large amounts of fuel and energy here.

> It goes without saying that the Round Table could not cover all areas in the effective use of fuel and energy resources. But the discussion, in our opinion, was businesslike and constructive, and it revealed a large number of urgent problems that require solution on a nationwide scale. The editorial board invites interested agencies and economic authorities to respond to the questions raised at the Round Table and to express competent opinions about them.

11409
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FISHERIES

MANAGEMENT PROBLEMS IN AZERBAYDZHAN FISHING ORGANIZATION DESCRIBED

Problems Outlined

Baku BAKINSKIY RABOCHIY in Russian 4 Feb 79 p 2

[Article by G. Bezkorovaynyy of Gousany: "Who Will Undo the Gausany 'Knot'?"]

[Text] At the beginning of the five-year plan, Ordzhonikidzevskiy Rayon was the initiator of the movement for "Not a Single Lagging Enterprise." The initiative was approved by the Central Committee of the ACP [Azerbaydzhan Communist Party], and was disseminated everywhere. The workers of Ordzhonikidzevskiy Rayon kept their word and all the enterprises in the rayon met the plan quotas for the first year of the five-year plan. The rayon won the rotating Red Banner of the ACP Central Committee, the Azerbaydzhan Council of Ministers, the Azerbaydzhan Trade Union Committee and the Azerbaydzhan Komsomol Central Committee.

People traveled to Surakhany to borrow experience. Later they stopped as the rayon was falling behind. Last year was particularly bad. The workers of Ordzhonikidzevskiy Rayon had a difficult time making ends meet for product sales and for the production volume they were unable to reach the quota level. As a result the rayon, where in comparison with 1976 the quantity of articles awarded the Sign of Quality increased by 3-fold and 105 persons had fulfilled the five-year plan in 2.5 years, where more than 2,000 leading workers reported that they had fulfilled the quotas of the 3 years of the five-year plan by the anniversary of the USSR Constitution and a majority of the collectives had met the increased obligations, was among the lagging.

And a year ago the Bakrybkholodflot [Baku Fishing Refrigerator Fleet] Administration did its "bit," ending the year with a deficit of 4.6 million rubles. For the rayon this was an unbearable burden.

"The idea of moving the office of the Bakrybkholodflot Administration from Shaumyanovskiy Rayon to Gousany and putting under its one roof all three enterprises located there, the fishing port, the cannery and the fleet, had been discussed for a long time. This was understandable, as warehouses

were to be located in Gousany, ship repair yards were to be built, and most importantly there was to be a reorganization in the management of the enterprise with a commodity turnover of 17 million rubles. In a word, everything had to be carefully weighed and thought out. Leonid Il'ich Brezhnev, in speaking in the Accountability Report to the 25th Party Congress on reorganizing the managerial structure cautioned: "It is essential to measure not seven, as is usually said, but rather eight or even nine times before cutting."

"We were visited, if I am not mistaken, by 15 commissions," said the secretary of the administration party bureau M. Aliyev. "They came from Astrakhan', where Kaspryba [Main Caspian Fishing Administration] is located, from the Union Ministry of Fisheries, and from the Azerrybprom [Azerbaydzhan Fishing Industry] Association. Each commission made its proposals and additions. And actually they are continuing even now. The commissions are all alike in that they did not listen to our opinion. For we felt that the port must not be unified and it should remain neutral, and that just the locating of the enterprises in Baku would not be a basis for the association."

However the case, in November 1976 all the Gousany enterprises were merged and the Bakrybkholodflot Administration was given the right of a legal entity. The economists showed the most serious attitude toward the order.

"In accord with the regulation governing the production unit, we demanded the liquidation of the bank accounts of the port and the plant and reporting was to be carried out according to a shop structure," said S. Sultanov, former chief bookkeeper of the administration and now occupying the same position at Azerrybprom. "The enterprise should speak 'the same language'."

After long debates, over more than a year, the demand of the bookkeeping office was met. At present the party and trade union organizations also work according to a shop structure. But what they have succeeded in has not been possible for the chief.

"When in March of last year I was appointed to Gousany, I determined to carry out the corresponding structural changes," said the chief of Bakrybkholodflot, G. Gasanov. "In actuality, why are there three directors and three chief engineers here? As my first move I decided to convert the fish cannery into a shop, particularly as within the administration there was a sprat shop which was the same capacity as the plant."

"The association could not agree with Gasanov," explained A. Okhanov who has recently been appointed to the position of the deputy general director of Azerrybprom. "This would entail the transfer of the plant to an inferior category, and consequently a reduction in the salaries of the specialists. And in Gousany there was already an acute lack of personnel."

The personnel question was a particular one. Let us return to the question of the reorganization.

Six months after the merging of the enterprises, a new order appeared. Bakrybkholodflot was given the ship repair yard located at Zykh, the cooperage at Akhmedli and the fish curing plant located in Nasiminskiy Rayon. And while the inclusion of the first two plants was justified by the fact that one was concerned with repairing the fleet and the other provided packaging for it, the fish curing plant had no involvement with the administration. The fish curing plant received 99.9 percent of its products from other enterprises and was located a 10-minute walk from Azerrybprom. But the Gousany workers did not even have a telephone line to the town.

But, as the order stated, this was done "for the purposes of production concentration and combination which provide a rise in operating efficiency of the association and an improvement in the management structure." The concluding paragraph of the order recommended that the corresponding comrades continue the work of improving the structure.

"Each quarter we sent off to Gousany a copy of the report submitted to Azerrybprom that we receive during the year 10-15 tons of fish caught by the scientific research vessel of Bakrybkholodflot. Our business ties with the administration ended with this," commented the chief engineer of the fish curing plant A. Guseynov on the 2 years that his enterprise had been part of the administration.

"According to the order the ship repair yard was ours," said the chief engineer of Bakrybkholodflot, R. Suleymanov. "Nevertheless, we pay the overhead, its personal account has not been closed at the State Bank, and the plant, in bypassing us, reports to Azerrybprom. The only thing which reminds us of its subordination is the fact that the enterprise leadership draws up its leave through us. All our proposals on a fundamental revision of the work of the ship repairmen who fulfill the plan by 30-40 percent have come to nothing. The vessels stand idle for years."

As for the barrel plant, after the issuing of the unification order, the disassembly of its equipment was started. The enterprise was transferred to...Neftechalinskiy Rayon.

Finally, in the autumn of last year the Gousany fishing port was taken away from the administration. It was to be neutral and not divide vessels into "its own" and "others." But the fishermen of Astrakhan', Gur'yev and Mangyshlak use the services of the port. Now the bank accounts, the transport, the buildings and the territory are being separated.

No matter with whom we spoke at the enterprises, at Bakrybkholodflot or Azerrybprom, everyone agreed that, to put it mildly, there had been a lack of coordination with the association. It had existed for 2 years only on paper. But even if all the points of the two orders on the association had been carried out, the Bakrybkholodflot Administration could scarcely have effectively directed its subdivisions. And it was not so much a question of the lack of telephone communications or a sufficient amount of transport, as it is one of personnel. The personnel situation is simply desperate.

First of all in the administration management itself. One is easily convinced of this by merely sitting for an hour or two in the chief's office. They come to him on any pretext whether it is the paying of wages to the crew of a departing vessel, the loss of an anchor, a shortage of five light bulbs, a report on unsold products, the placing of a young specialist in the dormitory and many other details which should be settled on the level of the services and the departments.

And not because G. Gasanov has established such a procedure. There is no one to solve these questions. And if the appropriate officials do exist, they at times are afraid to put their signature on a document as they do not know their duties. For simultaneously with the unification and separation, Bakrybkholodflot lost three chiefs of leading departments, a chief engineer and a chief bookkeeper who, with the exception of the chief engineer, have not been properly replaced. And there is no chief of the planning department. His duties...are carried out by coworkers of the department in turn. At present there is a young economist with a higher education but he had no knowledge of the specific features of the fleet, and prior to this he worked in the plant dining room in the security service. The subordinates who had enough of working without a chief decided to take him in hand and teach him the job.... And this is at an enterprise with an annual turnover of 17 million rubles!

Can much be settled with such a staff? But it must be settled once and for all and today. In all sections. Because the basic purpose of Bakrybkholodflot, as is stated in the order, is to produce high quality products and improve production efficiency. This should lead to satisfying the demands of the population and the national economy for the corresponding types of fish products.

The situation is no better with the crews and particularly the officers. Before the ship sets to sea each time, they begin "empressments." And at present they lack 30 navigators, engineers and electricians just for the large-tonnage fleet. And just five arrived out of all the graduates of the Caspian Navigation School who on 1 October were to be on board.

With such a state of affairs it is difficult to speak of labor and financial discipline, of indoctrination or the efficient use of the fleet. In January, at the very peak of fishing the large fish freezing vessel "Yana" was held up in port for several days as it had lost its anchor at sea. It turned out that the engineer had not inspected how the repairmen had assembled the anchor device during a recent overhaul. In the summer in anchoring in the bay, the "Ingul" and "Gousany" collided due to the incorrect selection of anchoring places by the captains. The vessels were sent for an overhaul with broken sides, and the repair time exceeded the planned by 2-3-fold. And the 6-month delay in the overhauls, for example, on the fish freezing vessel "Lenkoran'" cost the administration 400,000 rubles of gross product.

The new leadership of Bakrybkholodflot is making, although not always successful, desperate attempts to rectify the situation. Last November for the first time the production quota for the catch was fulfilled. And in December things were going well as for the first time a sufficient number of vessels for fulfilling the plan had set to sea. They were prevented by long storms. And in January the railroad failed and the vessels were kept idle awaiting unloading.

Changes to the better have also been spotted in Bakrybkholodflot. But in the near future we must not speak of a fundamental change in things.

It cannot be said that the party raykom holds a position of an outside observer, although we feel that it is not enough to put the emphasis on discussing the question at the bureau. And Azerrybprom is also informed of many problems of the administration, but the association itself is not in the best condition.

Considering that Azerrybprom does not possess a sufficient number of personnel and in Ordzhonikidzevskiy Rayon there are no enterprises similar to Bakrybkholodflot for which specialists could be taken, the situation will scarcely be altered for the fishermen without the help of Kaspryba. The administration can pull out of the extended slump and work stably, if its problems will be solved all together and simultaneously for all questions. The time has come to dot the "i's" on the question of unification or disunification.

Ministerial Reply

Baku BAKINSKIY RABOCHIY in Russian 24 Apr 79 p 2

[Article by N. Kudryavtsev, USSR deputy minister of fisheries: "The Criticism is Judged Valid"]

[Text] The USSR Ministry of Fisheries has reviewed the article "Who Will Undo the Gousany Knot" published in the newspaper BAKINSKIY RABOCHIY on 4 February 1979.

The shortcomings in the work and organizational structure of the Azerrybprom Association were correctly criticized. This structure requires improvement.

The article was discussed at the director's council of Kaspryba. Here proposals were made to improve the management of the association. Within a 2-week period Azerrybprom is to review these proposals and work out specific measures to implement them.

In April, executives from Kaspryba are to travel to Baku for agreeing upon and approving a final variation for the structure of Azerrybprom together with the republic directive bodies.

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FAST REACTOR DEVELOPMENT PROGRESSING WELL, BUT NOT COMPLETE

Moscow IZVESTIYA in Russian 30 May 79 p 2

[Interview with V. Tsykanov, director of the Scientific Research Institute of Atomic Reactors imeni V. I. Lenin, doctor of physico-mathematical sciences, by M. Piskunov: "The Energy of the Peaceful Atom"]

[Text] Ten years ago the BOR-60 research fast reactor, the largest in our country, was launched. This installation is located at the Scientific Research Institute of Atomic Reactors imeni V. I. Lenin, in the city of Dimitrovgrad, Ul'yanovskaya Oblast. Doctor of physico-mathematical sciences V. Tsykanov, director of the institute, tells our correspondent about the work of this important scientific center in the interview published below.

[Question] Special attention is being devoted to building fast atomic reactors in the USSR and abroad. What has brought about this interest?

[Answer] Above all it is the high efficiency of these reactors. Virtually all of the atomic power plants existing today use thermal reactors. They are the simplest and have worked well for us. But to operate them we need the scarce uranium-235, and reserves of it in nature are very limited. What will happen? Soviet scientists have determined that this problem can be solved by a new type of reactor, the fast reactor. Unlike standard thermoreactor, fast reactors use the part of uranium-238 which comprises 99 percent of total reserves.

But even that is not all. During the operating process uranium-238 is converted to an efficient new nuclear field, plutonium. Depending on the type of reactor it is even possible that the amount of plutonium formed will exceed the amount of uranium consumed. This paradox can be explained by the law of reproduction of nuclear fuel.

Thus, fast reactors can not only produce energy but also afford reproduction of fuel for themselves and for other atomic power plants. That is why we can hope in the future for a fundamental solution to the fuel problem for the future atomic power industry. It is entirely possible that atomic power plants will have unlimited amounts of this fuel precisely thanks to fast reactors.

[Question] Our country was the first in the world to begin research in the field of fast reactors. What contribution did the collective of your institute make to this research?

[Answer] Our institute has been studying these problems for a long time. We have established good facilities for this research. The SM-2 reactor, the largest research reactor in the world, and the largest hot laboratory in Europe offer a unique complex for studying the radiation properties of materials. Ten years ago we, working with scientists from other USSR institutes, launched a fast reactor with an energy capacity of 50,000 kilowatts. Notice, this reactor is not just an excellent research tool for scientists; it is also a source of electricity. In these 10 years our installation has already produced more than 200 million kilowatt-hours of electricity for the national economy. The prolonged accident-free operation of the reactor has demonstrated its high reliability and work capability and the correctness of our calculations. Various fuel elements, steam generator designs, and equipment modifications have been successfully tested at this installation. The 10-year program of scientific work made it possible to produce recommendations on improving reactors, in particular the energy reactor with desalinization of sea water that operates in the city of Shevchenko.

The findings made in our institute have become the property of world scientists. Many foreign delegations have visited Dimitrovgrad. International symposiums, conferences, and seminars have been held at our institute.

[Question] What is the reason that no fast reactors have yet been built that are as large as the thermal reactors?

[Answer] You see, all the problems are not solved yet. We have to increase the operating reliability of fast reactor equipment, improve its economic characteristics, and achieve better indexes for reproduction of nuclear fuel. Scientists in the Soviet Union and other countries are working on these problems. A great deal of experience has already been accumulated in our country, and that is exactly why the task set forth by the 25th party congress of stepping up construction and incorporation of fast reactors is fully realistic. In the coming year we plan to launch a fast reactor with a capacity of 600,000 kilowatts at the Beloyarskaya Atomic Power Plant. This is a high capacity figure. Even more powerful reactors are being developed. The transition to large generating units at atomic power

plants will help reduce specific capital investment and increase the efficiency of the new generation of atomic power plants. Fast reactors open a new page in the history of atomic energy.

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WINTER ENERGY PROBLEMS IN MOSCOW

Moscow MOSKOVSKAYA PRAVDA in Russian 24 May 79 p 1

[Article: "Prepare for Winter in Model Fashion"]

> [Text] The bureau of the Moscow City CPSU Committee has reviewed the question of work by industry, construction, transportation, and municipal services under the conditions of the past winter and tasks to prepare the city for the winter of 1979-1980.

The decree adopted by the bureau of the Moscow City CPSU Committee and the executive committee of the Moscow Soviet observed that, despite the difficulties of the winter of 1978-1979, in the city generally necessary conditions were provided for the work and everyday life of the citizens and for the collectives of industrial, construction, transportation, and municipal service enterprises to fulfill production plans and socialist obligations for 1978 and the first quarter of the current year.

At the same time, work during the winter disclosed a number of shortcomings and miscalculations in the work of certain economic organizations in preparation of energy, construction, transportation, housing operations, and repair services, road and general clean-up subdivisions, and certain plants and factories for operation under winter conditions.

Several of the heat and electric power plants of Mosenergo [Moscow Power System] did not get power equipment working smoothly. Certain industrial enterprises used too much electricity and fuel. New heat capacities are being launched too slowly at certain heat and electric power plants.

The housing operations and repair services in residential and public buildings did not always keep utilities and equipment in proper technical condition. The main administrations of roads and housing in Moscow and the managers of various municipal and rayon services and certain enterprises and institutions did not guarantee observance of proper clean-up procedures. Problems were noted in the work of

transportation organizations. In numerous cases rayon executive committees did not monitor prewinter work adequately. Supplementary measures to increase the operating reliability of housing and utilities were not taken in time.

The rayon CPSU committees and party organizations at enterprises in industry, construction, transportation, and municipal services did not always monitor prewinter work effectively and in some cases failed to be sufficiently demanding with economic managers.

The bureau of the Moscow City CPSU Committee and the executive committee of the Moscow Soviet have ratified a plan for basic steps to prepare for the winter of 1979-1980 in the rayons, city services, enterprises, and organizations.

It is suggested that rayon CPSU committees, party and trade union organizations, rayon executive committees, managers of main administrations, administrations, and divisions of the Moscow Soviet, board of directors of Mosenergo, and enterprises and organizations in industry, construction, transportation, and municipal services develop and ratify detailed schedules of prewinter work for each subdivision and monitor them constantly. Preparations for winter should be completed before 1 September 1979, involving the population and working people of the rayons more extensively in this work and making use of the regular inspection now underway in the city of the technical condition and orderliness of residential and public buildings and areas.

The board of directors of Mosenergo is obliged to complete overhaul of boilers, turbines, auxiliary equipment, and central heat and electric power plants at established times and insulate the buildings of boiler rooms and turbine shops and other production areas. They must secure commission certification of the readiness of power plants and heat and electrical grids for winter operation, bolster the emergency restoration and repair services, and take steps to raise the work qualifications of production personnel. The heat mains and grids must be repaired and tested on schedules reconciled with housing and other operations organizations.

The administration of fuel and energy should repair heat and gas equipment grids and production buildings and structures at the established times and see that normative reserves of fuel are established and maintained.

The main administration of housing in Moscow and the rayon executive committees should improve the organization of work to prepare housing for winter and insure timely insulation of buildings and preparation of the necessary engineering equipment. The housing dispatcher and emergency services should be strengthened, provided with necessary equipment, and staffed with qualified workers. The efforts of the collectives of housing operations and repair services and the enterprises that sponsor residential developments should be concentrated on performing all winter preparation jobs completely and at the established

time. There should be careful certification by a commission of the readiness of each residential structure for winter, including housing managed by departments and cooperatives.

The Moscow City Planning Commission, Administration of Fuel and Energy, and Main Administration of Housing in Moscow should develop a plan to certify the readiness of enterprises, organizations, housing, and municipal service facilities for work under winter conditions.

The decree obligates main administrations and administrations of the Moscow City executive committee and the executive committees of the rayon Soviets to review progress in preparations for winter at meetings of sessions and executive committees of the rayon Soviets, boards of directors of the main administrations, and conferences of subdivision managers.

The managers of the Main Administration for Housing and Civil Engineering Construction in Moscow, Main Administration for Industrial Construction in Moscow, Main Administration for Engineering Construction in Moscow, Moscow Trust for the Construction and Installation of Thermal Electric Power Plants, and the Main Administration for Repair Services in Moscow must insure fulfillment of work to prepare for winter at the established times in conformity with the plan of basic activities.

The construction trusts and administrations must insure introduction of the plan volumes of utility grids and roads in regions of large-scale housing construction and not allow buildings to be turned over for use with incomplete utility connections and construction work.

The Main Administration of Motor Vehicle Transportation for Moscow must insure that motor vehicle transportation is prepared for operation under winter conditions in time and create proper conditions for uninterrupted work by special fuel-hauling vehicles. The necessary number of snow removal trucks must be allocated.

The Main Administration of Roads must improve the quality of clean-up work in municipal areas, step up the rate and volume of road and sidewalk repair work, provide drivers for road service mechanical bases, and see that snow removal equipment is prepared.

The rayon CPSU committees and party organizations must insure effective monitoring of the fulfillment of steps by plants, factories, construction and transportation organizations, municipal service units, residential and public buildings, and utility grids and equipment for work under winter conditions. Economic managers must show greater responsibility for establishing the necessary conditions for the work and leisure activities of the citizens of Moscow during the winter. Trade union and Komsomol organizations should step up work to further socialist competition in labor collectives for timely and good preparation of housing, enterprises, and institutions for the winter of 1979-80.

City and rayon people's control committees are commissioned to organize regular inspections of work ratified by the present decree to prepare the city for winter.

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CONSTRUCTION OF SURGUT-URENGOY MAINLINE RAILROAD

Moscow PRAVDA in Russian 22 May 79 p 2

/Article by S. Vtorushin, PRAVDA correspondent: "With the Northern Mainline"/

/Text/ Three years ago in April, the brigade of V. Molozin laid the first kilometer of rails on the railroad mainline proceeding from Surgut to the Yamal-Nenets tundra. The event became the beginning of a new stage in development of the oil and gas resources of Western Siberia. The railroad mainline near the sources passed alongside many underground storehouses and made it possible to begin their exportation at accelerated rates. Access to the Urengoy field -- the largest blue fuel pool in the country -- will be opened up with completion of its construction. This will greatly accelerate development of the entire Tyumen' oil and gas complex.

Not only the oil workers and gas producers are impatiently awaiting the new railroad.

"It will provide the opportunity to improve geological prospecting of an enormous area and will open up additional oil and gas resources here," says the chief of the Tarkosalinsk Oil Prospecting Expedition A. Shaposhnikov.

The town builders who plan to build at the Urengoy field and on the bank of the Pur River, our engineers and loggers are linking their hopes with the first mainline. It will transform the entire life of an enormous region and will provide the opportunity to create large industrial terminals with highly developed industry, culture and everyday services to the population here. The builders of the new railroad understand this well. That is why they are attempting to do everything possible to turn it over for operation before the deadline.

The collective of the Tyumenstroyput' Administration has accumulated good experience of working under the difficult conditions of the Arctic. More than 350 kilometers of rail track has been laid and tens of water crossings have been constructed, including a large bridge across the Tromagin River, during three years on the Surgut-Urengoy railroad route. The track installers are achieving record advances. The brigade of the same V. Molozin has laid 4 kilometers of rails on some days. Not a single collective has yet achieved this result in the Ministry of Transport Construction.

All this has become possible due to the daring engineering solutions and the persistent daily search for reserves by each member of the collective of Tyumenstroyput' Administration. For example, take such a laborious operation as filling in the roadbed. For the first time in the practice of constructing similar mainlines, they began to build it here from sand -- the only construction material available in the Arctic. The sand is obtained by hydraulic aggradation from the bottom of the local rivers and lakes. Specialized Administration No. 489 of Transgidromakhanizatsiya Trust deposits more than five million cubic meters of soil annually for Tymenstroyput'.

Conversion to the new technique of constructing the roadbed has released the builders from delivering an enormous quantity of crushed stone into the Arctic. This daring solution provided a solid economic advantage to the state. After all, crushed stone must be transported here for 1,000 kilometers from Sverdlovskaya Oblast.

Progressive structural members are being used extensively in laying the railroad. Almost all the waterflow pipes are made of corrugated metal here. This makes it possible to assemble them on a special construction site and to transport them to the route in already finished sections. This technique sharply reduces the construction period and improves its quality.

Important attention is being assigned to the use of available technology in the collective of the Tyumenstroyput' Administration. The entire fleet of dump trucks is operating almost round the clock on the route. The shift factor of the vehicles comprises 2.6. This effective utilization of equipment became possible due to the well-organized maintenance of it and of the careful attitude of each driver toward his own truck.

The Surgut-Urengoy Railroad, not yet having become operational, is already dependably serving our national economy. More than 1.5 million tons of freight has been transported on it during three years. The freight is sent to the oil workers, gas producers and geologists. It would have been impossible to construct the Urengoy-Chelyabinsk gas pipeline within such compressed deadlines and to develop new oil and gas fields without this transport artery.

Understanding the enormous economic importance of the mainline, the transport builders are attempting to bring it up to 480 kilometers this year. And by the end of June of next year it should reach Tikhaya Station, located near the Urengoy field.

It would seem that there should be no serious problems with such good work among the collective of Tyumenstroyput' Administration. Unfortunately, this is not so.

"Last year, for example, we did not fulfill our socialist pledges although we had every opportunity to do this," says the chief of the administration Hero of Socialist Labor D. Korotchayev. "There have also been several interruptions this year."

The main misfortune of the builders is uneven material-technical supply. If a sufficienct quantity of rails were allocated to the Tyumen' workers, they could reach Noyabr'skaya Station one year earlier than the deadline and thus significantly facilitate exploitation of the Kholmogorsk group of fields for the oil workers. But the rails were not delivered and the railroad reached the station only last year rather than in 1977 as initially planned. The builders wasted much time due to a lack of ties. As a result they did not cope with their pledges and the roadbed could be laid only up to 300 kilometers.

The situation with supply has also not improved this year. Instead of 300,000 ties required by the Siberian workers during the second quarter, they were allocated only 70,000. Matters with construction of the railroad bridges have become significantly complicated. The route of the mainline has now emerged into a section intersected by many rivers. The crossings of the rivers should be constructed at accelerated rates. But the bridge structures are being delivered to the Arctic with a long delay. The Tyumen' bridgebuilders did not have their own material-technical base.

The Siberian workers are being very poorly provided with fuel. Their work in January and February was interrupted for practically this reason alone.

Unjustified and long time losses led to the fact that the collective of Tyumenstroyput' Administration essentially had no reserves for acceleration of work. During the first half of 1980, the Siberian workers must lay 100 kilometers of rails. To cope with this task, the Tyumen' workers must deliver no fewer than 50 kilometers of new and 40 kilometers of old rails to Tikhaya Station during the current navigation season. Only then will the builders be able to develop the station tracks in time and to lay the roadbed on the higher sections of the route during the summer.

It would seem that the Siberians should have complete unanimity in this problem with customer -- the Ministry of Railways. After all, we are talking about how to accelerate laying the road and of how to deliver freight more

rapidly on it to the most important fields. However, the customer has recently begun to delay in every way possible accelerated construction of the railroad.

The Ministry of Railways has begun to berate the Siberians for the fact that they are rushing forward too fast. In laying the railroad track, they are leaving poorly organized switches and are slowly developing the station management. We say directly that there is no reason for these reproaches. The Tyumenstroyput' Administration has turned over all the sections of the Tyumen'-Tobol'sk-Surgut route for permanent operation earlier than the planned deadlines and with good quality. The station management is being developed according to the plan and with sometimes surpassing of the plan. At the same time the management of the administration is actually attributing important significance to laying the main track. The specifics of the transport system of Tyumenskaya Oblast requires this. Each new kilometer of railroad is immediately included into temporary operation here. The Ministry of Railways has no advantages of any kind from this, since the oil workers, geologists, builders and gas producers are grateful to the collective of Tyumenstroyput' for this surpassing construction. It permits them to deliver freight where yesterday the only transport were helicopters and fishing boats.

Disagreements on the principles of construction severely interfere with the matter. The Surgut-Urengoy mainline passes near rivers and over marshy terrain at many locations of the route. To prevent erosion of the earth roadbed during the highest floods, it must be reinforced here by so-called beach embankments. To do this, more than four million cubic meters of soil must be delivered additionally to the route. The specialists of the administration are proposing to complete all the work in two stages. The base of the bed will be prepared, rails will be laid on it initially and then the embankments will be built up. The Ministry of Railways insists that everything be done simultaneously. If they proceed by this method, the arrival of the first train to Urengoy will be postponed by exactly one year. It is felt that this solution cannot be agreed upon.

The Siberian transport builders, and together with the subcontracting organizations they number approximately 25,000 persons, are standing on the threshhold of another, even more serious problem. The preliminary plans for the new five-year plan are now being compiled and they do not see any prospects in front of them. Despite the fact that the entire Tyumen' Fuel-Energy Complex is experiencing an enormous need for railroads, no one is involved in leading design of them.

Moreover, it is already clear to everyone that Western Siberia cannot get along without a second exit to the transport mainlines. The party, soviet and economic managers of the oblast feel that the time has come to reconstruct the railroad from Salekhard to Nadym. With regard to the beginning devel-

opment of the northern oil pools, construction of a railroad from Tikhaya Station to the Russkoye field must be provided during the next five-year plan. Incidentally, it could serve as the beginning of a mainline to Igarka and Noril'sk. Specialists of the Tyumenstroyput' Administration are confident that their collective is quite capable of laying a railroad to Noril'sk by the end of the next five-year plan. After all, it has accumulated enormous experience of operating under Arctic conditions and has its own bases here. One must also think about how to lay a railroad to the south from Nizhnevartovsk.

The Surgut-Urengoy Railroad is penetrating farther and farther north each day. The conquerors of the Siberian resources are moving along it behind the first train.

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PEOPLE'S CONTROL ACTIVITIES AT BAKU

Baku VYSHKA in Russian 26 May 79 p 3

[Article by V. Varnakova, head of the supernumerary publicity department of the Baku Municipal People's Control Committee: "By Duty and by Calling"]

[Text] Nikolay Tavakalov has been laboring approximately 30 years in the Knitting Association imeni N. Narimanov. He joined the party here, was frequently elected secretary of the party organization of the stocking-knitting shop, here he mastered his occupational skills and here he reached maturity.

Nikolay Tavakalov was elected chairman of the Head People's Control Group at the beginning of 1976 when the association was experiencing difficulties in fulfilling the plans and the quality of products did not correspond to the necessary requirements. The work of the group had to be begun from the beginning: it was carried out formally prior to this. Nikokay settled down with literature on people's control and went to the rayon and Baku municipal committees for advice. And then one would not think that within 3 years the work experience of the People's Control of the Association imeni N. Narimanov would be generalized and disseminated on republic scales. Tavakalov managed to create an effective burear of the head group and to clearly determine the duties of individual people's controllers. Moreover, he knew how to create numerous assets which included the production leaders, specialists and innovators. The shop groups give a quarterly account of the work completed to the head group. Watch persons from the head group and the bureau were attached to the shop groups to render assistance and to monitor their work and seminar-meetings were conducted regularly with the chairman of the shop groups and positions. The chairman of the head group never sends the watch persons for a check, as it should be, without having instructed them.

Someone said about Tavakalov that he is a leader of people's controllers both by duty and by calling.

The head people's control group enjoys high prestige in the collective.

Upon a signal coming into the office of the head group, Tavakalov together with the manager of the control department on maintaining socialist property L. Kulakova and the chairman of the Komsomol'skiy Prozhektor I. Isayev came

to the knitting shop where high overconsumption of raw materials was permitted. They first decided to check the use of thread on the bobbins. The empty bobbins were removed from the waste materials one after the other and it was ascertained that from 10 to 70 grams of yarn was left on many of them. Together with the chairman of the shop group, the assistant foreman S. Gusev attempted to analyze the reasons for the high waste -- it comprised 5 tons during 7 months of 1977. As was determined, the explanation was simple -- preventive inspection of the equipment was conducted here from time to time, which lead to low quality of the linen and to a high percentage of cutting off.

A type of exhibition of the rejected material was made after completing the check of undepleted bobbins and cutting off. These "trophies" were shown to all the knitting shop workers during their lunch break. They also looked in here from other shops. This was also talked about in the "Satire window" and the shop chief A. Zeynalov reported on methods of correcting deficiencies at a meeting of the people's control group.

Tavakalov feels that it is not always necessary to resort to apply administrative punishment and that the force of public opinion is even more effective than orders. But of course in this case it was necessary to organize the widest publicity. The manager of the publicity department M. Arakelova assists the chairman in this. Thus it was in this case -- the management and collective of th knitting shop took the criticism of themselves close to heart and in 1978 the shop achieved a saving of more than 1,500 kilograms of raw material. And with the active support of watch persons, a total of 4.3 tons of raw material, 120,000 kilowatt-hours of electric power and 487 tons of comparison fuel were saved at the enterprise in 1978.

As is known, 1979 was declared the International Year of the Child. The group bureau worked out a number of measures which enhance the quality of childrens' articles. At the suggestion of N. Tavakalov, the group was involved in problems related to improving the work of kindergartens and children's institutions and the living conditions of the young male and female workers in the association's dormitory. A complex check of the economic activity of childrens' institutions No. 2, kindergarten No. 1 and the dormitory was made.

From the materials of the check of the dormitory, the superintendent N. Alkhanova and passport supervisor G. Perezhogina were fired and deputy director Sh. Mirzoyev was reprimanded by order of the director for crude abuses found by the people's controllers. Official reports of the checks of childrens' institutions No. 2 and kindergarten No. 1, where many significant deficiencies were also determined, were turned over to the management of the association for implementation of strict measures.

Tavakalov is firmly convinced that innovation and people's control are "twin brothers" and that an increase of labor productivity, improvement of product quality and efficient use of raw material and materials are senseless without innovative suggestions and inventions of the watch persons and

production leaders. That is why at his initiative a control department for introduction of new technology, efficiency and inventiveness was created in the head group, which is managed by one of the enterprise's best efficiency experts and inventors V. Podorozhnov.

Nikolay Tavakalov has many awards and incentives. He was awarded the Honorary Certificate of VOIR of the USSR for success in efficiency creativity, he was awarded the Order of the Red Banner of Labor for fulfilling the Ninth Five-Year Plan ahead of schedule and he was awarded the Honorary Certificate of the Presidium of the Azerbaijan SSR Supreme Soviet for his vigorous public activity.

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BAKU-TYUMEN' COOPERATION IN OIL PRODUCTION

Baku VYSHKA in Russian 26 May 79 p 2

[Article by A. Nikol'skiy: "Baku-Tyumen' -- Enriching the Traditions"]

[Text] It seems that quite recently -- on 22 June 1960 -- the test well produced Western Siberia's first oil in the upper reaches of the Konda River in the taiga near the forest village of Shaim. In 1965 the production of "black gold" still did not exceed 1 million tons, while in 1970 the Tyumen' oil workers produced 28.5 million tons for the country. During the current, 3rd year of the five-year plan, 245 million tons of liquid fuel have already been pumped into the reservoirs. No other country in the world has known or knows these rates. The Baku workers know what it is to drill a well and what a great diverse economy a modern field is and they know how complex it is to develop this economy and to provide continuous rhythmic operation of it. Another, no less complex problem -- oil transportation -- arose from the very first days for the conquerers of the Tyumen' treasures. Pipeline construction is also a bright page of developing the underground storehouses of the region. It was carried out and is being carried out at the same vigorous rates. The world's largest Samotlor-Al'met'yevsk oil pipeline 2,100 kilometers long was constructed within 10 months. Approximately 4 years were required for construction of this complex by the existing norms. Oil pipelines are building bridges across the Urals, from Asia to Europe, intersecting forests, highways, the taiga, lakes and rivers.

Close Ties of Friendship

The oil industry of the Soviet Union got its start in the fields of Azerbaijan. And the start was "excellent." The "black gold" producers of the republic completed the task of the first five-year plan, the anniversary of which is now being widely celebrated everywhere, within 2.5 years. The collective of the Azneft' Association was awarded the country's highest award -- the Order of Lenin -- for this.

"You began the 20th century. The baton has now passed to you. The Eighth Five-Year Plan was the first petroleum five-year plan for the Tyumen' workers. They, like the Baku workers in their own time, were awarded the Order of Lenin at that time for their great success in developing fuel production."

We are talking with the director of the West Siberian Scientific Research Geological Oil Prospecting Institute, winner of the Lenin Prize, Corresponding Member of the USSR Academy of Sciences I. I. Nesterov. Ivan Ivanovich talks about the enormous scientific foundation which was laid in Azerbaijan in study of petroleum problems.

"All we geologists-oil workers," he notes, "studied from the textbooks created at Baku. And now the Azerbaijan scientific school continues to feed industry with valuable ideas and interesting developments. Our and other Tyumen' institutes have been linked for many years by close creative cooperation to the scientists of the Petroleum and Chemistry Institute imeni M. Azizbekov."

"Specifically, we are now studying together with them the characteristics of the new Salym field," says I. I. Nesterov. "I would like to dwell on it in more detail. And not only because it is promising, but also because the name of your fellow countryman is related to its discovery."

We were talking about Farman Kurbanovich Salmanov, a representative of the Azerbaijan geological school, now head of all geological prospecting work of petroleum profile which are conducted at Tyumen'.

The scientist briefly informed us of the history and discovery of the field. Test-well drilling was noted in this region. The given depth to which the shaft had to reach was determined at around 2 kilometers. Clay was deposited at the intermediate horizons and this section had to be passed through without stopping according to the planned program. After all, according to existing theory, there are no oil pools and can be none in clay media.

It is difficult to follow the process of the birth of an idea. It is complex and at the same time illogical and contradictory. But in any case it rests on three premises -- knowledge, experience and intuition. The plan for organizing sinking of this well was born in Salmanov on the basis of knowledge, experience and intuition. The issued instructions notwithstanding, he made, out of his own fear and on his own risk a different decision: to drill a well with stops every 100 meters and to conduct detailed geophysical investigations of the beds each time.

"I think you know about the final," the director of the institute ended his story, "a gusher burst from the well without reaching the given marker."

Thus, oil was found in clay media in opposition to all existing theories. This unique type of case forces one to reconsider many positions of scientists. At the same time it opens up the broadest possibilities for oil explorations. Explorations are conducted where oil was not anticipated and where it was previously assumed that there should be no oil.

And in these explorations we will also in the future proceed hand in hand with our old good friends -- the oil workers of Azerbaijan.

After leaving Tyumen', we were shown a new book, still as they say smelling of typographic ink -- fundamental research devoted to the characteristics of developing the oil fields of Western Siberia. Among the authors of the paper were the name of our countryman, Academician of the Azerbaijan SSR Academy of Sciences A. Kh. Mirzadzhanzade.

Having returned to Baku and having met with Azad Khalilovich, we found out that a new book about the characteristics of developing the gas fields of Western Siberia is now being prepared for publication, also in creative cooperation with the Tyumen' workers.

Neftyanyye Kamni -- Samotlor

The winter landscapes of Samotlor from the helicopter remind one somewhat of a picture which is revealed when you approach Neftyanyye Kamni by air. The solid white blanket is like an endless smooth sea. It is intersected by the black threads of overbridges similar to our trestles. They extent to large platforms on which groups of wells are located.

If there is a difference, it is only in scale. The platforms here are located tens of kilometers from each other.

The well shafts go into the ground in a fan from each cluster. The Siberian workers studied the experience of organizing oblique drilling and arrangement of the clusters in Azerbaijan. We found the interesting book "The Oil and Gas of Tyumen." These are documents related to the history of developing the fields of Western Siberia. There we found many interesting materials which tell specifically about participation in development of the virgin oil lands of Western Siberia of our republic. An excerpt from the speech of the First Secretary of the Tyumen' CPSU Obkom is presented in the book in which gratitude is expressed to the workers of Azerbaijan "for attention and support in development of the kray." Let us read the resolution of the Komsomol Central Committee. The contribution of the komsomol organization of Azerbaijan "in organizing the oil and gas fields and in organizing everyday services and leisure activities of the young people" of Tyumenskaya Oblast is also especially noted in it.

We met the young ambassadors of our republic in the cities and settlements, in the oil fields and in prospecting expeditions. They labor selflessly on any section, show themselves to be excellent masters of well production and drilling and work in scientific research and planning institutes. We met the young architect Gamlet Mekhtiyev, a graduate of Azerbaijan Polytechnical Institute, at Nizhnevartovsk. He animatedly told us about today's innovation of the town and proudly pointed out the apartment buildings, production complexes and kindergartens constructed from his designs.

New reinforcements have now been poured into the ranks of the Siberian oil workers. A large detachment of young enthusiasts who expressed the desire, continuing the traditions of heroes of the first five-year plans, to make their own worthy contribution to development of the petroleum industry of the motherland, was sent at the end of March from Baku to Tyumenskaya Oblast.

But let us return to the book "The Oil and Gas of Tyumen'." We said already that the Siberian workers studied the experience of the Baku workers in organization of cluster drilling and in sinking oblique wells. But this is not all. An excerpt from the speech of the minister of the petroleum industry of the USSR V. D. Shashin at the Plenary Session of the Tyumen' party obkom in January of 1970 is included in the collection:

"With the rather long distance of the fields and difficulties in daily bringing a large number of people to work and back home," says the minister, "we must create a watch settlement alongside the production area in which workers working on the job for 7-10 days will rest."

"We have this example of organizing work in our sector -- these are the fields on the Caspian Sea at Neftyanyye Kamni and others."

"Neftyanyye Kamni is located 80-100 kilometers from land. Those coming to the job for 7 days live in dormitories of the watch settlement in which all conditions have been created for good relaxation of people not working."

"In this case, one must say that it is no simpler to move along the stormy Caspian Sea than from Nefteyugansk to Mushkino (the Pravdinskoye oil field)."

"This should be especially taken into account when organizing work and everyday services in development of Samotlor and a number of other fields."

It was difficult for us to ascertain on the fields of Samotlor and on other fields at the experience of creating well-organized watch settlements on the example of Nevtyanyye Kamni is being introduced well and successfully.

There Where It Is More Difficult

Upon meeting our countrymen upon arrival at Tyumenskaya Oblast, we usually knew beforehand where they are living and where and with whome they are working. But there were also surprises. One of the most remarkable things occurred when we visited Gennadiy Levin's brigade. It is hardly necessary to present this person to the reader, who is now known through the entire country -- a prominent drilling foreman and Hero of Socialist Labor.

But I think there are few who know that Gennadiy is a native of Baku. His father is an oil worker. He labored selflessly on our fields during the first five-year plans. But the call was thrown out: "Oil workers of Azerbaijan! Let us assist in developing the second Baku."

Gennadiy's father did not think it over for a long time. He gathered his family and hit the road. He worked on the fields of Kuybyshevskaya Oblast. There were no rail cars at that time -- there were only tents and mud huts. Gennadiy followed in his father's footsteps -- he became an oil worker. And when the country again called on the producers of "black gold" of the old oil regions to help in developing the virgin oil land of the third Baku -- the riches of Western Siberia, Gennadiy, like his father, threw his rucksack over his shoulder and hit the road.

We met Sergey Muravlenko at Samotlor where G. Levin's brigade is working. Different threads link him to Baku.

Sergey is the son of V. Muravlenko, with whose name the legendary history of discovery and development of the resources of Western Siberia is related. He was one of the first drillers of Tyumen' oil and is a winner of the Lenin Prize and Hero of Socialist Labor. A man of great courage and a warm-hearted man, he, like a soldier, died at his labor post.

S. Muravlenko is a young engineer and oil worker.

"I had no doubts about selecting my occupation," he relates. "I remember as a boy how my father and Farman Kurbanovich argued at our house in the evenings. And when I woke up in the morning he had still not laid down to sleep."

He proudly tells that when defending his diploma, the chairman of the examining committee was friend of his father, Doctor of Geological-Mineralogical Sciences, winner of the Lenin Prize and Hero of Socialist Labor F. K. Salmanov.

Sergey heads the large oil field at Samotlor. The young Komsomol collective of the field is competing with the young oil field of NGDU [Oil and Gas Producing Administration] imeni 25th CPSU Congress. The Tyumen' workers were quite recently guests of their friends -- they checked fulfillment of the pledges and exchanged work experience.

And here is another of the unplanned surprises. We did not know that our countryman Murbariz Isayevich Nuriyev, who we had met at Nefteyugansk, heads one of the largest administrations of Tyumen' -- the NGDU Mamontovoneft'. A native of Lenkoran' and graduate of the Institute of Oil and Chemistry, he participated in exploitation of the fields of the second Baku, worked in Tatariya and has now become a Siberian.

He talks with animation about his work and proudly gives the names of the Baku workers who are laboring selflessly on the Tyumen' land, adding to the glorious traditions which they established during the first years of the Soviet five-year plans.

The ties of friendship which link those who first walked on the virgin oil lands of the Soviet Union -- the Azerbaijan workers with the conquerers of the black treasures of Western Siberia -- are multifaceted.

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PEOPLE'S CONTROL ACTIVITIES AT ALI-BAYRAMLY

Baku VYSHKA in Russian 26 May 79 p 3

[Article by S. Sergeyev: "Act Rather Than Wait"]

[Text] Several years ago I had occasion to write in the Ali-Bayramly city newspaper MAYAK about Rzakhan Babayev's fitter's brigade of the Thermal Automatics and Measurements Shop -- one of the best at GRES imeni Il'ich. I talked about how the young people here not only study their occupational skills under the supervision of experienced tutors, but also acquire good ideological tempering and nurture in themselves an active vital position. In characterizing one of the innovators -- Aliyar Kuliyev, the brigade leader recalled the following episode. The young worker was having a conversation with him about the fact that the air temperature in the drums where the primary sensors are installed was impermissibly high. This was not news to Babayev. He himself had long ago worried that the connecting cables and instruments would be damaged due to the high temperature. If the production process was carried out in the optimum mode, overconsumption of fuel was permitted. Thinking that the conversation was only being held to complain about working conditions, Babayev prepared to answer the newcomer as he had always answered in similar cases. Namely, that he had informed the central people's control group of the station about this and that the peoples' controllers made the appropriate checks. But no one has yet to suggest a fundamental solution of the problem. The technicians and innovators of the GRES will rack their brains and a solution will be found. One need only have a little patience and even better to puzzle over this problem.

But Kuliyev did not think of complaining. He immediately went to the brigade leader to propose his own solution. The worker felt it was necessary to provide small windows of the hatch type in the drums in order to admit air. The suggestion was adopted and introduced after consultation with the technicians. As a result, the instruments began to operate much longer and more dependably.

And now I am again at the GRES imeni Il'ich. I was interested how things were going with R. Babayev's brigade. It turned out that it is now operating in the same composition. Only today's newcomers have become recognized

masters of their affairs. And Aliyar Kuliyev, moreover, is one of the best people's controllers at Ali-Bayramly. He was awarded the Honorary Certificate of the People's Control Committee of the USSR.

He talked about it at one of the energy units where Kuliyev and brigade members A. Kerimov and N. Aliyev were installing an instrument by a new scheme.

He is approximately 30 years old of medium height and neat. His attentive eyes look out frankly and simply.

How did he become a people's controller?

Elections of the people's control group were held shortly after the incident in the shop. And brigade leader Rzakhan Babayev, to its new staff, said:

"He is obviously a meticulous fellow and his ideas operate in the proper direction toward the common good."

The experienced foreman was not in error in evaluating the job and moral qualities of his pupil. Shortly together with him and the senior shop foreman Yu. Abdullayev, Kuliyev engaged in active participation in developing a new, more reliable and simpler circuit for connecting the instrument which indicates the percentage of oxygen content in the gases exhausted to the atmosphere. Other creative developments followed this. The work efficiency of a people's controller is traditionally measured by the number of raids and checks made. But Kuliyev evaluates his own work by the number of innovator suggestions made.

"I feel that the work of a people's controller is somewhat similar to that of an innovator," Kuliyev says, seemingly thinking aloud. "Both one and the other have the goal of increasing production efficiency and work quality."

At the GRES, this primarily means to reduce consumption of comparison fuel per consumption of 1 kilowatt-hour of electric power. All raids made by the people's controllers and all innovator suggestions, including those made by Kuliyev, have this very goal. And later this is not at all the state of things: you, the controller, look to see what is poorly organized and you the innovator think of how to improve it. You have a serious idea and you must implement it. If disorder is noted somewhere, you manage to correct it. And this is how everyone should operate without standing on the sidelines. This is Aliyar Kuliyev's fundamental position.

There are many like him at the GRES. And of course the most dependable of them is Nazim Aliyev, his pupil. They are neighbors. This is the Kuliyev who convinced his buddy to come work with him on the brigade at the GRES after school. And as Rzakhan Babayev taught Aliyar his occupation at that time, he imparted a love for it in him as he now transfers everything that he knows and can find out to Nazim.

In 1978 the Ali-Bayramly power engineers reduced the specific consumption of comparison fuel by 0.2 grams compared to the norm. And a saving of 7,140 tons of comparison fuel were saved because of this.

Among them are the tons saved by Aliyar Kuliyev.

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MACHINE BUILDING PRODUCTION AT PETROZAVODSK

Moscow PRAVDA in Russian 18 May 79 p 1

[Article by F. Kovalev, editor of the newspaper MASHINOSTROITEL': "For the Order of the Siberians"]

> [Text] The words "Tobol'sk order" have become common recently at the Petrozavodsk Machine Building Association imeni V. I. Lenin. Not a single party meeting and service meeting could literally be held without them. Manufacture of the rectification columns for the Tobol'sk Petrochemical Complex has begun here. They comprise the gas fractionating installation which will convert gas to the fundamental base of valuable chemical products.

This improved equipment is being manufactured for the first time in our country and considerably exceeds corresponding foreign analogs by their parameters. The design of the columns was developed at the Novo-Kuybyshev Branch of the Moscow Institute Giprokauchuk [State Planning and Scientific Research Institute of the Synthetic Rubber Industry], while the working documentation was developed at the Department of the Chief Designer of Chemical Equipment of the Petrozavodsk Association.

A socialist competition has now been organized between the collectives of the shops and engineering departments to fulfill the order of the Siberians on time. A staff headed by the chief engineer of the association L. Sukharev was created to coordinate the efforts.

Designers and engineers S. Levashov, D. Trifonov, L. Menaker, S. Kuznetsov, T. Shaposhnik and A. Vasil'yev were the first to begin solving the crucial task. They proposed that the columns be delivered to the customer in finished units rather than in blocks with subsequent assembly and welding of them at the construction site, as was previously done, which permits a reduction in the periods of installation work.

At the same time with development of the design documentation, material preparation of the plant was extensively and universally organized. Special technical training of the engineers, foremen and workers who had to manufacture this equipment was organized at the initiative of the designers.

The platforms where the multiton blocks will be assembled and welded into finished apparatus have already been prepared and equipped with the necessary apparatus and mechanisms on the dock constructed on the shore of Lake Onega. It should be explained here that the gigantic equipment cannot be delivered from Petrozavodsk to Tobol'sk by any other means except water transport. The following plan of shipping the columns by water has been proposed. After assembly and welding of the 90-meter giants on the dock, they will be launched into the water and will be delivered by catamaran to Leningrad Port and from there they will travel by the Northern Sea Route to the Ob' Gulf.

Clear material-technical support is of enormous significance in timely fulfillment of the order and maintenance of the high labor enthusiasm of the association collective. The columns are being constructed from special rolled steel and thousands of tons of it are required. Deliveries of the metal strictly within the established deadlines by the ferrous metallurgy enterprises would accelerate construction of the petrochemical complex. The metal is now arriving behind schedule. The Petrozavodsk workers had to manufacture and deliver two columns to the Tobol'sk workers this year, but metal was received for only one column.

The fact that the builders are delaying construction of the press shop and that the association must send the work pieces of the spherical bottoms to other enterprises of Minkhimmash [Ministry of the Chemical Industry] also complicates the work.

The Tobol'sk order gives rise to new samples of creative competition and cooperation between the engineers and workers. The main burden of manufacturing the columns has now been laid on the collective of the 11th Boiler-Welding Shop and the department of the chief welder. An agreement for a competition has been concluded between them. The department has pledged to issue the technological documentation and to assist the workers and foremen directly on the sections and to train the boiler operators and welders. In turn the shop collective is attempting to strictly adhere to the technology and to provide high quality work. The workers of the section supervised by senior foreman Yu. Lyabegin are performing the most complex operations.

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OIL AND GAS PIPELINE CONSTRUCTION

Kiev PRAVDA UKRAINY in Russian 23 May 79 p 2

[Article by P. Borodavkin, professor of the Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin, doctor of technical sciences: "The Main Line of the Industry"]

[Text] The demand for oil and gas in the national economy of the USSR is increasing with each year. Deliveries of this raw material by CEMA contracts are also increasing. The traditional oil and gas regions of the country no longer can fully satisfy all the needs; therefore, the center of gravity of oil and gas production is gradually shifting toward Western and Eastern Siberia and to the Arctic.

Simultaneously with this, the problem of oil and gas delivery from the production sites to the consumption sites is ever more acute. The only type of transport which can successfully solve the problem is pipeline transport. Thousands of kilometers of steel pipes 1,200-1,400 millimeters in diameter have already linked the fields of northern Tyumenskaya Oblast to the center of the country. The annual capital investments in construction are now more than 3 billion rubles.

The responsibility of scientists and designers for the quality of prospecting is increasing incomparably. It is difficult to imagine what results from an error, let us say, in selecting the directions of the pipeline routes, their technological and design dependability, problems of environmental protection and so on. Scientific research, planning and design organizations have in the past few years began to devote main attention to optimization of pipeline transport. For the first time in worldwide practice, Soviet investigators are solving problems of selecting the direction of the pipeline and of improving all its parameters in a complex manner. This approach makes it possible to achieve high reliability of the route with the least expenditures on construction, operation and with minimum losses inflicted on nature.

As we can see, the problems are complex. To lay a pipeline, one must overcome many kilometers of permafrost, swamps, tens of large and hundreds of small rivers and mountainous regions, one must detour cities, settlements

and agricultural lands and one must intersect highways and railroads. Of course, a mainline can be laid along a straight line but usually this variant is far from always advantageous. One can also detour around all obstacles. Again the length of the pipeline and operating expenses will be increased.

Soviet scientists have worked out the theory of searching for optimum routes and classifying the conditions of terrain over the entire territory of the USSR. The scientists and designers of the Ukraine, specifically of Kiev, Donetsk and Khar'kov, have made an important contribution to this. They have compiled tens of programs, they participate in development of automated gas and oil pipeline design systems and so on. Let us say that the scientists of the Institute of Electric Welding imeni Ye. O. Paton have developed multilayer pipes. Of course, this is the country's first solution which makes it possible to remove from the news of the day the problem of avalanche destruction of mainlines. However, the Paton institute scientists need the active assistance of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], Mingazprom [Ministry of the Gas Industry] and of Minchermet [Ministry of Ferrous Metallurgy] of the Ukrainian SSR in acceleration of laboratory, plant and field tests of these pipelines and transfer of them to production. After all, not only the problem of preventing avalanche destruction is being solved. The carrying capacity of the gas pipelines is being increased, so that the working pressure can be raised from 79 to 120 atmospheres. This cannot be done in pipes of ordinary design.

Oil and gas pumping technology has undergone great changes. What should be the pipe diameter, in what form should gas be pumped (hot, cold or liquid), in what form should oil be pumped (at ambient air temperature or in a heated state) and how should the pumping stations be arranged? Scientists of the Moscow Institutes of the Petrochemical and Gas Industry imeni I. M. Gubkin, VNIIgaz [All-Union Scientific Research Institute of Natural Gas], Giprotruboprovod [State Institute for the Planning of Main Pipelines], the Leningrad Institute Giprospetsgaz [State Institute for the Planning of Special Structures in the Gas Industry] and also the Ukrainian institutes Yuzhgipronefteprovod [Southern Institute for the Planning of Oil Pipelines], YuzhNIIgiprogaz [expansion unknown], Soyuzgazproyekt [expansion unknown] and others.

The Donetsk YuzhNIIgiprogaz developed a system of programs for optimization of the design process. The contribution of research associates of the Kiev Yuzhgipronefteprovod to optimization of planning solutions is also great. And a total of more than 60 percent of all gas pipelines and more than 30 percent of oil pipelines in the USSR are being designed by Ukrainian specialists.

It would be good if not only computer methods, but also materials of aerospace surveys were used more and more in developments. These materials must be prepared beforehand from the most progressive trends and a common input data bank should be created. The Ukrainian planning institutes are capable of raising this important matter.

The use of optimized methods of planning at the initial stage alone yielded a significant economic effect. The Urgal-Vandan-Nakhodka oil pipeline, whose route was selected by the Yuzhgipronefteprovod Institute, is interesting in this regard. The Kiev scientists managed to economize (as they say, "on the tip of a feather") an entire pumping and several tens of kilometers of pipes 1,200 millimeters in diameter.

One of the most important problems is environmental protection. Incorrect operation of pipelines, oil and gas and ammonia depots, petroleum products and so on inflicts considerable losses on the environment. Special attention should be devoted here to construction of underwater crossings of oil pipelines in rivers and on the shelf of the sea. The designers should make those decisions which would completely eliminate oil from falling into reservoirs. The workers of the Yuzhgipronefteprovod Institute have begun to use a new design of an underwater pipeline -- a type of pipe in a pipe with the space between the pipes filled with a cement-sand solution. This is how the crossing of the Kuyal'nitskiy Estuary was designed. However, Ukrgazstroy [expansion unknown] made this crossing with deviation from the design and therefore a loss of sealing of the pipes is possible. I feel that underwater oil pipelines should be laid in the two-pipe version across all large rivers of the Ukraine. Moreover, they do not require additional expenditures for construction.

Most of the problems that I have touched upon were discussed at the first All-Union Conference of Oil and Gas Workers, which was recently held at Kiev. Specific recommendations were adopted. One must assume that they will help us to cope successfully with the serious task -- with providing uninterrupted delivery of oil, gas and other products to any point of our country.

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OIL PRODUCTION METHODS DISCUSSED

Baku VYSHKA in Russian 29 May 79 p 2

[Article by O. Nechipurenko: "Make the Road Wider to Tertiary Production Methods"]

[Text] This time the members of the party committee of AzNIPIneft' [expansion unknown] gathered far from the walls of the institute. They came to Artem Island to a joint meeting of the institute party committee and the party committee of NGDU [Oil and Gas Administration] Artemneftegaz. The purpose was to discuss problems of introducing the institute's developments on increasing the oil production of beds into management and of developing measures for further intensification of it.

The oil field of Artem Island has been exploited since 1902. However, there is still a significant part of available oil here in the interior. The reason is the complex geological structure of productive horizons of the Kirmakinskaya and Podkirmakinskaya series and the main thing is the high viscosity of the oil deposited in them, which makes extraction difficult.

The collective of Artemneftegaz has done a lot to force the interior to be more generous. One of the main methods is contour flooding to maintain bed pressure. A process flow diagram was developed, on the basis of which three series of delivery wells were selected. As a result the oil production from the Kirmakinskaya series has essentially become stabilized during the past several years -- its decrease comprised only 1 percent.

However, it is impossible to stop with this. It was important to utilize the field resources to the maximum possible. And this is impossible to achieve in areas with heavy, viscous oil without resorting to thermal methods of acting on the pool.

And an experiment was conducted here recently for the first time in worldwide practice in cooperation with specialists of the laboratory of AzNIPIneft' on thermal action on the beds, headed by Candidate of Technical Sciences D. Dzhamalov -- the bed lying under water in the open sea was "set afire." The first results of this operation are pleasing -- the increase in oil

production during the first quarter of this year comprised 1,200 tons almost without additional expenditures.

Success did not come immediately. Initially the experiment on introducing the method of intrabed combustion was carried out by oil workers together with research associates of the department of the institute on intrabed combustion, headed by A. Bogopol'skiy, at one of the oldest sections of the field of Artem Island 5 years ago in well No. 208. The complexities in this case were more than enough: the bed initially "did not accept" the necessary quantity of air and then plugging became more frequent. Nevertheless, through persistent, tedious labor of the scientists and specialists of the shop of the scientific research institutes and the production operations of NGDU -- senior engineer M. Agayeva, operators for chemical treatment of the wells A. Movsumov and M. Mirzoyev, workers of shop No. 1 on oil and gas production -- geologist B. Sarkisova, foreman O. Kuliyev, operators A. Zeynalov and T. Dzhabarov, fitters Ye. Arzhanov and G. Malinnikov and many others still managed to solve most problems related to development of the production process. They converted from so-called dry to wet combustion and the yield of the bed was increased by additional perforation of the wells, preliminary treatment of their bottoms with oil, nitric acid and so on. And in order not to use wells correctly producing oil for the experiment, the oil field workers restored five boreholes from those shut down. As a result, although it was planned to increase oil production throughout the NGDU 3,200 tons in 1977 and 1978, almost four times more was produced -- 12,000 tons.

This was all discussed at the joint session of party committees of AzNIPIneft' and NGDU Artemneftegaz. But not only successes were at the center of attention there. One also had to note methods for further increasing the oil yield of the beds and to determine reserves. There were many of them. The main factor delaying further introduction of the method of intrabed combustion is the shortage of compressors and compressed air. Therefore, it was recommended that the geological service of NGDU devote greater attention to timely conversion of compressor wells to the deep-well pumping method of operation. It was proposed that the coking method and filling the wells with foam-cement be used to provide the normal combustion process.

Another method of thermal action on beds containing viscous oil -- steam pumping -- is still being inadequately introduced at NGDU. An experimental steam generating plant operating on sea water would help the oil workers to achieve success even here. However, the impediment was something different. Four shall wells of special design had to be drilled to pump steam into the beds. This generally not especially complicated work has been drawn out for several years at NGDU.

And now when the wells are ready, it turned out that a number of other problems related to this process such as, for example, how to insulate the steam pipelines, has not been solved.

Problems of increasing the oil yield of the beds, common to the oil workers of the republic, were also touched on at the joint session of the party committees. It was noted that a discussion conducted more than 2 years ago on the pages of VYSHKA on introduction of tertiary methods of production in Azerbaijan fields, during which scientists and producers introduced many specific proposals and desires, yielded its own results.

The All-Union Scientific Production Association Soyuztermneft', created at the end of 1977, now compiles the plans for development of the Umbaki field at the NGDU Karadagneft', where the method of intrabed combustion will be introduced. It has been suggested that up to 15,000 tons of oil be produced annually by this method. Eight wells 450 meters deep each should be drilled according to the plan, new pipelines should be laid, the system of oil collection and preparation should be reconstructed and powerful compressor equipment should be installed.

A similar plan is being compiled to expand the area of using the method on the Khorosan site at NGDU Leninneft'. Specifically, approximately 50 wells should be drilled there, which will make it possible to bring oil production by this method from the current 15,000 tons to 100,000 tons annually. Powerful compressors specially designed to maintain intrabed combustion are already beginning to arrive to arm the oil workers. Unlike the presently operating compressors, they provide five times greater air pressure with maximum productivity of 100,000 cubic meters per day.

Unfortunately, the proper attention to modern methods of production intensification are far from being manifested everywhere. Such a reprimand should specifically be made toward the management of NGDU Kirovneft'.

"The workers of our institute 'ignited' the bed in the Chakhnaglyar area with great difficulty," relates the party committee secretary of AzNIPIneft' Ya. Sharifov, "and then everything fell apart since someone through carelessness stopped access of compressed air to the well."

Pumping steam into the bed was also unsuccessful at Kirovneft'. Only one of three steam generators, which pumps steam into 1 well instead of 11 wells, is operating here.

It is strange that the administration for increasing the oil yield of beds and of major overhaul of wells of the Azneft' Association occupies the position of permanent observer in solving problems of introducing tertiary methods. True, the administration carries out a large volume of operations to accomplish various traditional methods of acting on the bottom zone of wells, but the time has come to become firmly involved in tertiary methods as well. Moreover, steam generating plants were managed by it at some time, but they have now been transferred to the oil and gas administrations. It is difficult to understand what caused this step backward.

As the meeting of party committees of NGDU Artemneft' and of AzNIPIneft' indicated, introduction of progressive methods of production and technological

solutions will be more successful, the stronger the tie of science and industry. It is emphasized in the adopted decision that party groups and primary party organizations may and should play a more active role in strengthening this cooperation. Problems of production intensification should constantly be at the center of attention of the party organizations and should be systematically discussed at meetings of the party bureau and at general party meetings.

It was decided to conduct joint meetings of the party committees of AzNIPIneft' and of NGDU Artemneftgaz once per quarter to discuss problems of introducing tertiary methods.

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OIL AND GAS PRODUCTION IN THE TYUMEN' AREA

Moscow TRUD in Russian 18 May 79 p 2

[Article by V. Goryunov, chairman of the Tyumen' trade-union obkom of workers of the oil and gas industry: "Man in the Arctic"]

[Text] Tyumen' is today the main oil and gas producing field of the country. Every 3rd ton of oil produced in the country is from Tyumen'. This is a matter of the hands, intellect and persistence of those who came to a severe region and are becoming at home there. What kind of people are these and what has brought them to high latitudes to settlements lost in the tayga or tunda? Some feel that the deciding attractive factor is the northernmost ruble to which various substantial bonuses are automatically "added."

I don't intend to quarrel with this opinion. Money still does not play the final role in our lively contribution.

And even so I will not place money in first place among the factors which attract new settlers to our oblast. The majority of the influx is young people. Their motives for coming are usually of a higher order -- the desire for civil, moral and occupational self-confirmation and the desire for independence. Many young people instill a feeling of fundamental patriotism in us and the desire to be there where it is most difficult. These qualities of the Soviet people are discussed in the decree of the CPSU Central Committee "On further improvement of ideological and political-educational work": "The Leninist proposition that the state is strong with the consciousness of the masses is more than ever timely under conditions of developed socialism." It is these qualities that also determine the nature of the actions and vital aspirations of most young new settlers. I know many who, having achieved their desires on material well-being, have firmly settled in new locations. I also know those who return to where they came from within 6 months or a year.

Almost half the workers are changed annually in the oil and gas regions. Is it that all of them have failed the examination for persistence? The misfortune is that this is not true. The reason is quite different, under those conditions and in that life arrangement which made their northern stay

impossible. Not only are we not seriously struggling with personnel turnover and consequently with a shortage of workers, but to a specific degree this regulates us. Regardless of how strange, turnover relieves the enterprise managers of many concerns and difficulties and permits them to organize the life of the new settlers according to lightened and simplified versions.

A single person initially needs a minimum of service demands -- a bed in a dormitory and a place in the dining hall. But this minimum, acceptable during the first years of developing the fields and construction of towns, continues to dominate even subsequently. Man is coping with this even today. But he then wants to bring his family but there are very few prospects to receive at least a room and a place in the children's institutions during the next few years. Those who have been lucky enough to receive a room or apartment usually settle in the Arctic for many years. And the remaining ones leave.

It may seem at first glance that the facilitated variant of life organization avoids large economic expenditures. It is a fact that this is an illusory economy. In fact everything is exactly opposite. The qualified, already experienced specialist leaves and he is replaced by a newcomer. Turnover is a constant factor in reducing labor productivity. The direct expenses from this are numbered in the tens of millions of rubles. For example, there is a shortage of approximately 900 drivers in the Production Transport Administration of the Nizhnevartovskneftegaz Association. There is simply no place for them to live. This means that as many trucks are not being operated under full load. Who has counted up these losses? They number in the millions and this is only in a single administration.

The tradition of the ministries, who are involved in development of the fields, to regulate construction of housing-service objects to a secondary position from year to year and to regularly fail to fulfill the plans established by the government inflicts an enormous loss. During the past five-year plan, the oil workers did not receive 100,000 square meters of housing according to the plan, the gas workers did not receive 234,000 square meters, 4 schools, approximately 20 kindergartens and institutions and tens of other vitally important structures.

We are building a lot. During 3 years of the current five-year plan, for example, 1.9 million square meters of housing, preschool institutions for 9,670 seats, dining halls for 12,450 seats and much more has been turned over. But much is a relative concept. The state plans require a lot more. During these same 3 years, housing has been underfulfilled by 450,000 square meters, kindergartens and institutions by 8,155 seats and commercial enterprises by 5,570 square meters. Last year alone, the oil and gas workers and builders received 140,000 square meters of housing less than planned. Minpromstroy [Ministry of the Construction Industry] of the USSR, or rather its association at Nizhnevartovsk, last year turned over only half the planned number of apartment buildings for operation.

It is easy to see that the shortage of housing, other social service and communal buildings is increasing from year to year. The need for housing through Glavtyumenneftegaz [Main Tyumen' Administration for the Construction of Petroleum and Gas Industry Enterprises] alone comprises 2,356,000 square meters. This is an entire city! The provision of housing calculated per worker is decreasing from year to year.

There can be no stable production without organized services -- this is an old truism. Our producing, construction, transport and other enterprises have now reached the position when the problem of housing, dining halls, department stores, clubs and similar buildings is becoming a serious obstacle in further increasing the capacities and volumes of work. Extensive lists of those requiring housing are hanging in the administrations, trusts and different institutions. These lists are increasing more and more each year. A true alarm on this matter is being sounded at meetings and conferences. The trade-union obkom receives more letters in which people validly complain of the fact that, despite a solid work record, they are unable to receive housing. Here is an example which S. Dolgorukova, a resident of Nizhnevartovsk, writes:

"I have been living in Nizhnevartovsk for 18 years. I came here according to distribution after completing the technical school. For the past 4 years I have been working at the radio station at SU-14 [Construction Administration] of the Tyumen'gazmontazh Trust. There are three persons in my family. I am living in an old settlement in an emergency wooden house without conveniences. An apartment building will be constructed this year at the administration but I will hardly be able to obtain an apartment. There are 70 persons in line ahead of me."

"During the first years of work, I traveled around the northern regions many times from the radio station, including by reindeer, and I sometimes spent the night on the snow. At that time I felt that all of this was within the order of things. But now things are different: my husband is severely ill and my daughter is ailing. A well-appointed apartment is our age-old dream. But how much longer must we hope for it?"

The trade-union obkom last year checked the housing-service conditions in several northern settlements -- Pangody, Poykovskiy and Mamontovo. Whereas capital housing is still being introduced in the base towns, the addition is insignificant in these settlements. For example, 646 families live in a dormitory and 3,000 persons live in rail cars and self-built "huts" at Pangody. The housing shortage, according to calculations of the Nadymgazprom Association, comprises more than 51,000 square meters, of which 44,000 are required to resettle families from the dormitories. The settlement needs hospitals, schools, kindergartens, dining halls, stores, a bath, laundry, club, provisions warehouses and refrigerators. The plans for capital construction do not fully take into account the needs of the settlement. But even these "truncated" plans are not being fulfilled.

The oil workers' settlements are an exact copy of Pangody. A total of 407 families lives in rail cars and "huts" at Poykovskiy and 1,740 of 4,000 persons live in the same housing at Mamontovo. Here to wash in the bath house, to lunch in the dining hall or to register a child at the kindergarten is a hopeless undertaking. Let us be frank: who would be satisfied with these conditions today? Moreover, the complement of workers changes completely within 1 year at these settlements and even more rapidly at some enterprises. For example, 420 persons were released and 367 were hired in 1977 at the Mamontovo Drilling Administration, while 100 persons more were released here in 1978. The same pattern exists at other enterprises. We have long and diligently criticized the local administrations of Minpromstroy and Minneftegazstroy for the lag in housing construction. I do not plan to justify them. The organization of labor in housing construction is low and the capacities of the construction industry are being created very slowly. And in order to be objective, one must recognize that the required volumes of construction by the subdivisions of these ministries are not effective. Many subdivisions are simply unable to take on themselves the volumes of work which are outlined in the state plans. They are above their actual capabilities. And if everything that is planned is still included in their "lists" under pressure, at the end of the year much of it supplements the enormous list of unfinished objects. The plans are not being fulfilled from year to year.

I feel that our planning bodies should clearly determine what today's need for housing and social-everyday services is in the oil and gas regions. What part of this volume can be realized by local construction administrations on the basis of the real capabilities and what part are they unable to "raise."

There is exceptional experience in our country of concentrating forces and funds on shock construction projects. This also includes development of housing-service conditions. Typical examples are construction of the towns of Tol'yatti and Naberezhnyye Chelny. Along with local construction efforts, collectives from other oblasts and republics were recruited here. But even these construction projects had a number of advantages compared to the Tyumen' Arctic -- reliable transport mainlines, bases of the construction industry and a more stable and experienced contingent of workers. It is twice as complex to build at Tyumen'.

Oil and gas are needed throughout the country. It is now delivered from here to many cities, oblasts and republics. It would be logical if management of the construction of the most important oil and gas centers were taken over there. I understand that they also have their own plans and difficulties. But even so these difficulties are not so great and insurmountable as here at Tyumen'. For example, the oblast having at its disposal a powerful construction industry could finish construction without extensive losses to itself, could supply equipment and could train personnel of the housing construction combine at Nadym and another could take on concern for the settlement of gas workers at Pangody and so on.

The state is not stingy in funds for development of the oil centers; the money is there. But it is important that the money be expended rationally. And this largely depends on stabilization of the personnel in Siberia and on the conditions of their labor and everyday life.

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GOOD PROGRESS ON URENGOY-CHELYABINSK GAS PIPELINE CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 May 79 p 1

[Article by N. Tyurin, settlement of Tarko-Sale, Yamalo-Nenets Autonomous Okrug: "Test on the Line"]

> [Text] Testing has been successfully concluded on the northern sector of the gas pipeline under construction from Urengoy to Chelyabinsk. The collective of Severtruboprovodstroy [Northern Pipeline Construction] Trust installed the 380-kilometer trunk line in record time.

It is deserted and quiet now on the road along the pipeline. The road is melting off in the spring sunshine. Yet not long ago the permafrost and deep snow along the line saw hundreds of wheels and tracks packing down the winter road and the blue light of welding flickered above the forest day and night.

We are driving with G. Zlenko, secretary of the Purovskiy Rayon party committee to Pyako-Pur, the settlement of construction workers where the headquarters of Severtruboprovodstroy is located. Gennadiy Vasil'yevich knows every turn in the road, as they say. Construction of the pipeline was a crucial concern for the rayon committee and there were weeks when Zlenko never left the line.

"In January the cold got down to 58 degrees, but the line kept on moving," he paged through his notebook and presented another figure. "The daily output of the leading welding brigades was 1.5-2 kilometers, the most possible under such conditions."

On the map the section 0-380 does not look unusual at all. The red line starts at the spot, marked in yellow pencil, of the Urengoy gas deposit, makes a sharp turn at the settlement of Tarko-Sale, and crosses a blue web of rivers, dropping swiftly to the south, toward Surgut and Nizhnevartovsk. But the special features of the first leg of the route become understandable when we look at a more detailed map. The site where Severtruboprovodstroy is working is a swampy

polar lowland. Pipe can be delivered by rail at just two points, and this means that the sector must be completed before the spring thaw, in alliance with the cold weather, which holds the winter road and swamp firmly in "working" condition.

All these things made great demands for organizing the work of line builders. The project became a major test of the collective's ability to solve complex problems in which technology, control of production, and the human factor are closely intertwined. And although the collective does not lack experience, the voices of skeptics were heard, people who "knew for sure ahead of time" that the incomplete line would be drowned by the furious spring floods in June when the tundra, viewed from a helicopter, looks like a sea all the way to the horizon. Life has given its answer clearly in the 150-day quick march by Severtruboprovodstroy across the tundra, rivers, and taiga, proving that the engineering calculations were well-founded.

From the window of the van of A. Chernikov, chief of construction headquarters and chief engineer of Glavsibtruboprovodstroy, one can see a radio tower trembling in the wind, the green caps of the cedars, and a crowd of different colored vehicles in front of the dining hall. The construction workers are leaving a nice community for the operations workers. This is one of the four bases from which the "watch" truck drove the next shift to work in all kinds of weather.

"Some people think that the sector must be done with at least eight production lines, that is, construction should be started at the same time in eight different places which move toward one another," Chernikov says. "We were able to defend our point of view, make the detachments twice as large, and create the margin of safety needed for organizational maneuvering with the line units. Our plan of setting up high-powered mobile subdivisions worked out completely. Clear dividing lines between line units, machinery assembled at central points, and effective competition — this was a situation that allowed the workers to show their enterprise and persistence in working toward the assigned goal."

No, you cannot deny that the builders of this difficult 380-kilometer section were able to choose the best variation. The plan called for installing 62,000 weights, heavy reinforced concrete blocks that would prevent the pipeline from floating up out of the trench in the meltwater. Severtruboprovodstroy specialists put only 22,000 weights on the line, using opening struts instead. These steel rods are not only clever in design terms and reliable to use; they also save the labor of hundreds of people. Another example is the mobile dispatching post that operated at the busiest points on the line. The competent, efficient dispatchers whose commands from radio-equipped "Uaziki" prevented "bottlenecks" and directed freight flows into the necessary channels saved the transportation workers a good deal of time, effort, and tension. And how about the underwater crossings, the arms of the pipeline over the unpredictable tributaries of the

beautiful Ilur? They were installed without the slightest deviation from a rigorous schedule in which sober consideration of the reserves of machinery and technology replaced emotion.

It is not hard to understand the attitude of Boris Pavlovich Diduk: his brigade welded more than 120 kilometers of pipeline, and numerous times amazed experienced line workers with production records, always doing high quality work. The line was a kind of test for the brigade of a new method of labor organization: one connection is welded by 16 welders grouped into four teams of four. What did this method produce?

"Maximum personal accountability," answers B. Diduk. "The flow method of work teaches people to combine efforts, and in the brigade today we have working at the connecting point not just welders, but also diesel operators, bulldozer drivers, and pipe laying machinists. What do we plan next? A new gas pipeline. But first the workers will take a vacation, to have a good look around and see how the gardens are blooming and the sea glistens beneath the morning son."

There is no use pretending that they did not think about the "outside world" when they stood in their tough working clothes in the icy wind, drove vehicles over the virgin snow, and sat up all night long over designs and calculations. But the main objective, now attained, was their section of the gas pipeline. In the near future it and the presently operating line will supply 33 million cubic meters of fuel a year to the cities and plants of the "outside world."

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INTERNATIONAL CONGRESS ON COAL DRESSING HELD IN DONETSK

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 May 79 p 2

[Article by I. Blagov, chairman of the international organizing committee of the Congres on Coal Dressing, chief of the administration of Coal Dressing of the USSR Ministry of the Coal Industry, Donetsk: "The Key to Improving Quality"]

> [Text] The 8th International Congress on Coal Dressing opened in Donetsk yesterday. About 60 delegates from 28 different countries are taking part in its work.

This is the first time such a congress has been held in our country. This congress is more representative than early ones. In Donetsk 36 reports on timely problems of development of the equipment and technology of coal dressing, comprehensive use of fuel, and environmental protection will be given and discussed. Considerable attention will be devoted to the creation of ultramodern coal dressing factories and developing and refining industrial processes.

Our country is one of the world leaders in development of the coal industry and coal dressing. At the present time half of the coal extracted in our country is used for energy production and 20 percent goes for the needs of metallurgical production. A large part of the fuel goes to meet domestic demand.

The coal mines are receiving more highly productive equipment today. Whereas the productivity of rotary machines today is up to 5,000 cubic meters of rock an hour, in the near future giants will be produced capable of extracting 12,500 cubic meters. Underground extraction uses contemporary means of full mechanization and automation.

At the same time, mining and energy workers are disturbed by the decrease in the quality of fuel being extracted and the rise in its content of mineral impurities. In just the last decade the amount of rock in coal being extracted has more than doubled. In the same

time its ash content has risen, and now stands at 24 percent. This is not good enough for the consumers.

The only way to remove impurities from coal is mechanical dressing. This is a major branch of the coal industry today. Suffice it to say that each year our dressing facilities process 350 million tons of fuel. By 1980 this figure will be 480 million tons.

The country has numerous large dressing factories whose technical equipment is as good as any in the world. Three large factories, the Chervonograd with a capacity of 9.6 million tons, the Dolzhanskaya-Kapital'naya with a capacity of 6.8 million tons, and the Eastern with a capacity of 6 million tons a year are being built and prepared for operations. The Neryungri Central Dressing Factory is under construction in the highly promising South Yakut coal basin and will process 10 million tons of valuable coking coal a year.

Progressive methods of coal dressing are used extensively at many enterprises. Flotation has been incorporated and is used to process fine classes of various grades of coal, including anthracite. The technology for dressing in curving flow lines has been developed and introduced for the first time in the world. This has made it possible to significantly increase the extraction of combustible material when dressing high-ash energy coal.

The achievements of the Soviet Union in this field are arousing great interest among foreign specialists. Several participants of the current congress have already visited the Donets Basin. Edvads, one of Australia's leading specialists in coal dressing, left the following remark in the visitors book at the Krasnodon Central Dressing Factory: "I have visited many dressing factories in Europe, America, and on other continents. I have never seen and cannot imagine how such absolute cleanliness can be attained. I congratulate Soviet specialists on outstanding achievements in the development of technology."

Participants of the congress will visit the new Komsomol'skaya and Krasnaya Zvezda dressing factories in the Donets Basin and the Sibir' factory in the Kuznets Basin and will be familiarized with the work of the UkrNIIugleobogashcheniye [Ukrainian Scientific Research Institute of Coal Dressing] in Voroshilovgrad.

The international exhibition of coal dressing equipment opened at the same time as the congress. At this exhibition one may see contemporary coal dressing equipment and technology, and equipment for automating production processes and monitoring coal quality. Business meetings will be held and trade agreements worked out at the exhibition.

The 8th International Congress of Coal Dressing will foster further development of science and technology, exchange of know-how, and a strengthening of practical contacts among scientists and specialists from different countries.

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REPEATED PLANNING MISTAKES HINDER DEVELOPMENT OF KANSK-ACHINSK COAL

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 19 May 79 p 2

[Article by B. Pilchugin, head of the coal industry sector of the Krasnoyarskiy Kray CPSU Committee: "'Extra' Coal"]

[Text] Brown Siberian coals are playing a growing part in the country's fuel-energy balance. Increased extraction of them is supposed to make up for the shortage of Kuznets and Donets coals and to help save oil and gas, which is increasingly used for industrial needs as extraction grows. "Already in the 10th Five-Year Plan the use of Ekibastuz and Kansk-Achinsk coals to produce electricity will expand significantly and a number of large thermal power plants in the Urals and Volga region will switch to coal instead of mazut oil," we read in the documents of the 25th CPSU Congress.

To realize the program outlined by the congress, however, we must not only increase open-cut coal extraction at the Kansk-Achinsk and other basins in the eastern part of the country, but also re-equip operating thermal power plants in the Urals and Volga region, adapt their burners for Kansk-Achinsk coals.

Siberian miners are handling their part of the program. They are confidently increasing the rate of fuel extraction and reducing its prime cost. With the Ekibastuz miners they lead the country in these indexes. The volume of brown coal extraction can increase even further, but the use of this fuel is limited by the fact that the thermal power plants in the western part of the country still have not been converted to burn it.

Nonetheless, each year USSR Gosplan and the USSR Ministry of the Coal Industry set assignments for extraction by the enterprises of the Kansk-Achinsk basin that considerably exceed the national economy's demand for brown Siberian coal. Moreoever, they set the plans too high even when there is no possibility of fulfilling them. Not a quarter has passed when the Krasnoyarskugol' [Krasnoyarsk Coal] Production Association did not receive an order to lower the plan assignment in the final days of the calendar period. Statistics for many years show that the initial yearly requests for Kansk-Achinsk brown coal exceed factual demand by 2.5-3 million tons.

We have analyzed the practices employed in formulating plan assignments for extraction of Kansk-Achinsk coal for the last 10 years. We will cite just one example of this kind of planning. The largest consumer of Kansk-Achinsk coal in Siberia is the Krasnoyarskenergo [Krasnoyarsk Energy] Administration. Each year it sends its coal request to the fuel and transportation administration of the USSR Ministry of Power and Electrification with a reserve amount of no more than 1.5 percent, as is proper. But after going through the labyrinth of offices at the fuel and transportation administration of the power ministry the request goes to the balances division of USSR Gosplan with a hefty "add-on" of as much as 10 percent beyond the actual fuel needs. The same thing happens with the requests of other consumers.

Here is what happens next. The request is ratified at USSR Gosplan, and additional material resources and equipment are allocated to extract the "extra" coal at enterprises of the Ministry of the Coal Industry; the wages fund increases accordingly. The 10 percent of coal is a fictitious amount, but real railroad cars are allocated to haul it. Yet as soon as the miners of the Nazarovo strip mine begin fulfilling the plan in strict conformity with the consumers' requests, the extra coal will be discovered immediately. Enormous above-norm stocks of fuel accumulate at the thermal power plants. There is no place left to put the coal and dozens of trains are converted into storehouses on wheels. And this occurs at a time when railroad cars are in very short supply! Between just August and October of last year more than 90 trains of coal not accepted by the customers at the scheduled time were left standing idle, causing 86,400 car-hours to be lost.

But even this is not the end of the losses. Extracted brown coal cannot stand prolonged storage, and if above-norm supplies accumulate at dumps spontaneous combustion often occurs. The coal becomes acidic, losing its heat-creating capability. In this way, incorrect planning leads to significant losses of fuel and overexpenditure of material resources associated with its extraction.

The people at higher administrative levels are well aware that the consumers are consistently and deliberately requesting too much Kansk-Achinsk coal. When the state plan for 1978 and 1979 was being formulated the Krasnoyarskiy Kray CPSU Committee and the Krasnoyarskugol' Association appealed to USSR Gosplan and USSR Gossnab to bring the plan for extraction into line with actual national economic demand for this type of fuel. But our suggestions did not receive support from the divisions of the coal, peat, and shale industries and balances at Gosplan. S. Ostrovskiy and E. Vertel', the directors of these two divisions, agree that the plan for extraction of Kansk-Achinsk coal greatly exceeds the actual demand for it, but at the same time they point out that the country has a strained coal balance.

So here is the secret of the extra Kansk-Achinsk coal! If the USSR Ministry of the Coal Industry cannot secure an increase of 2.5 million tons of scare fuel in the Donets Basin in conformity with control figures for national economic development, these millions of tons can be reassigned

to the Kansk-Achinsk basin with a stroke of the pen, and the balance will thereby match the national demand. This kind of correspondence can be achieved on paper, and it creates the appearance of orderliness. But what about the "extra" coal? It is like the winter sun -- it shines in the plan, but it does not keep anything warm.

Of course, the Gosplan workers console the Siberian miners by saying not to worry about this coal, that it will be taken out of the plan for the next year.

But this is the same old flawed system of correcting a plan that is known to be unrealistic which is hurting the economy today. The interests of the worker collectives of the strip mines also suffer from this system.

The nonmaterial damage of such planning is also substantial.

The disproportion between extraction of Kansk-Achinsk coals and their consumption illustrates that the USSR Ministry of Power and Electrification is not devoting nearly enough attention to the problem of switching Ural and Volga thermal power plants from mazut oil to brown Siberian coal. The program of the Kansk-Achinsk fuel-energy complex provides an efficient solution to this problem. In addition to powerful thermal power plants this program envisions construction of energy technology combines. Thermochemical treatment of Siberian coals will open the way to send this fuel to the European part of the country. High-speed pyrolysis set up on a broad industrial basis will make it possible to save 150-200 million tons of liquid fuel a year. Energy technology combines will produce high-calorie solid fuel that does not pollute the atmosphere when burned. Unlike natural coal hauling, transportation of semicoke over long distances will be economically profitable.

In the recently-adopted decree "Creation of the Kansk-Achinsk Fuel-Energy Complex," the CPSU Central Committee and USSR Council of Ministers recognized the need to see that the latest scientific and technical advances are used in the construction and operation of local enterprises and facilities. The first step toward building the energy technology combines of the complex should be launching the ETKh-175 installation in Krasnoyarsk.

However, construction work there has come to a virtual halt this year. P. Falaleyev, first deputy minister of power and electrification, has been assigned to monitor work progress, but monitoring is obviously inadequate. Therefore it was correct for SOTSIALISTICHESKAYA INDUSTRIYA to take this key project under surveillance.

The first quarter has ended. Just as happened last year, important officials in the USSR Ministry of the Coal Industry and the USSR Ministry of Power and Electrification wasted several weeks correcting the unrealistic extraction plan and bringing it into line with consumption capabilities. As a result, more than 300,000 tons of "extra" coal was found again. Much time and effort went into correction procedures. The situation with construction of the ETKh-175 shows that this energy could have been used better elsewhere.

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ANSWERS TO DRILLING METHODS ARTICLE IN JANUARY NEWSPAPER ARTICLE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 May 79 p 2

[Responses to article by V. Fotokakis, director of the Chernovtsy Machine Building Plant imeni F. E. Dzerzhinskiy, and L. Mikolyuk, secretary of the plant party committee, and V. Khaliullin, secretary of the party committee of the Salavat Machine Building Plant: "Answers to SOTSIALISTICHESKAYA INDUSTRIYA"]

[Text] V. Fotokakis and L. Mikolyuk, Chernovtsy Machine Building Plant imeni F. E. Dzerzhinskiy

The article "Reserves of the Petroleum Pool" published on 31 January 1979 was reviewed at an expanded meeting of the plant party committee. Workers, foremen, and shop heads plus specialists from the plant services responsible for delivery of equipment to the Ministry of the Petroleum Industry were invited to the meeting.

It was acknowledged that equipment that deviated from the specifications of technical documents has been delivered. The responsible persons were given party evaluations and concrete steps were adopted to improve the operating characteristics of equipment for intensification of yield from petroleum pools. A testing stand has been built for the plant that will enable workers to check almost all the working parameters of machines, and specialists and workers from the Groznyy and Borislav Petroleum Administrations have been sent in to help launch the UPGG 9/120 installations. One is already in operation at the Borislav administration.

Following the protocol of the meeting regarding the questions of manufacturing and operating equipment in modular units (the protocol was ratified by deputy minister of the petroleum industry E. M. Khalimov and deputy minister of chemical and petroleum machine building L. S. Glikman on 1 February 1979), supplementary measures are being taken at the plant to solve the problems raised in the article "Reserves of the Petroleum Pool."

The OVG-3 experimental installation has been delivered to the Tatar ASSR Petroleum Association and is in use. A source of combustion within the

layer has been created. Testing of the test model of the UPGG 9/120 installation at the plant is coming to an end.

V. Khaliullin, Salavat Machine Building Plant

The article "Reserves of the Petroleum Pool" (SOTSIALISTICHESKAYA INDUSTRIYA 31 January 1979) aroused great concern in the collective by touching on the professional prestige of the shop employees, especially those who were directly involved in manufacturing UDPV-5 installations. Discussion of the article brought to light a number of deviations from delivery specifications that occurred for particular modular units. In February specialists from the enterprise were sent to the organizations that received these units to clear up the situation. All problems that were found were taken care of in the first half of March.

The party committee of the association has begun monitoring the timetable for manufacturing modular units for the petroleum industry, and it has been suggested that the appropriate services give greater attention to the quality and completeness of the equipment being produced.

We can also report that the association fulfilled its assignment to make two UDPV-5 installations for Bashneft' [Bashkir ASSR Petroleum Administration] and has shipped them to the customer.

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NEW DRILL STEM ATTACHMENT TO PACK WELLSHAFT, PREVENT GUSHERS

Moscow NEFTYANIK in Russian No 4, Apr 79 inside back cover

[Article: "The PPV-170 Packer-Preventer for Drilling Stems"]

[Text] The PPV-170 packer-preventer is designed to pack a well at the level where it is installed and to prevent intensive gas and petroleum shows from becoming open discharges and gushing when drilling wells with bits of 190-214 millimeters diameter. The packer is mounted over extra-strong drilling pipe above the zone of possible shows of layer fluid and can be located in an open or encased well shaft. The packer-preventer can be used with the turbine and rotary methods of drilling.

The design of the PPV-170 packer-preventer (see Figure a) includes, in addition to the details mentioned below, valve heads 8, support ball bearings 9, rubber packing rings 16, and sealing rings 17.

For packing the well ball 2, which is placed in a special conductor between the square and the drilling stem or in the riser of the drilling rig beforehand, is released into the flow of drilling solution. Ball 2 passes elastic saddle 13 and settles in sleeve 14, moving bushing 12 downward and pressing spring 15. At excess pressure of 15-20 kilograms per square centimeter screws 11 are sheared off and bushing 12 moves down until it rests against bushing 7. The drilling solution is pumped through these opened intakes (Figure b) into the chamber of the packing element 10, which inflates at this time and presses against the walls on the well. At an excess pressure of 50-70 kilograms per square centimeter above the ball 2, screws 3 are sheared off and bushings 4, 7, and 12 move downward together until they rest against the rounded protrusion of casing 1. At this point limiter 6 is activated, the intake openings are tightly closed, and the flushing openings above the packer are opened. Then the well continues to be flushed to replace the degasified drilling solution with a loaded solution. During flushing of the well the pressure in the drilling tubes above the packer and also the counterpressure created at the mouth are transferred to the zone below the packer (see Figure c). In this way it is possible to pump a drilling

Diameter of Opening in Elastic Saddle, millimeters	52
Pressure of Packing, kilograms per square centimeter	50-70
Pressure of Depacking, kilograms per square centimeter	40-50
Maximum Diameter of Well at Installation Point of Packer-Preventer, millimeters	240
Hydraulically Inflated Sleeve-Type Rubberized Sealing Ring:	
Working Length, millimeters	950
External Diameter, millimeters	160
Internal Diameter, millimeters	115
Permissible Pressure Drop, kilograms per square centimeter	250
Working Temperature, degrees C.	100

The PPV-170 packer-preventer was developed by VNIIBT [All-Union Scientific Research Institute of Drilling Equipment, address 117049, Moscow, Leninskiy Prospekt 6] and manufactured by the VNIIBT Experimental Plant.

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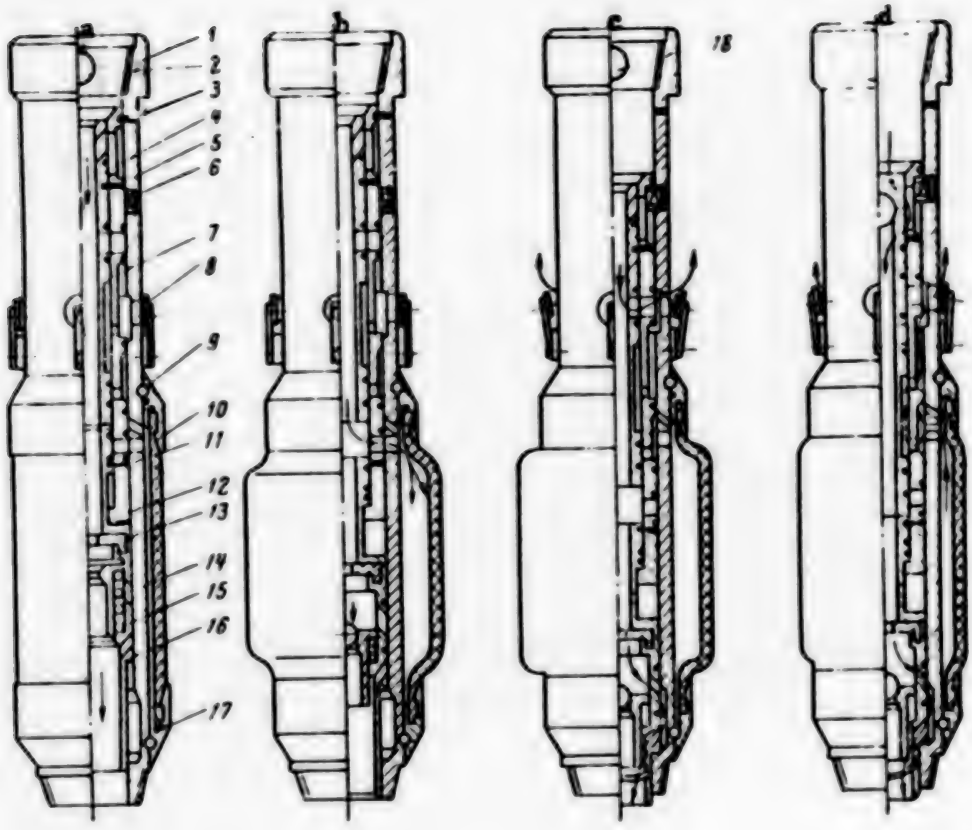

solution into a producing layer with the well space outside the tubes closed off. When well flushing stops ball 2, pressing against elastic saddle 13, acts as a reverse valve.

After gas and petroleum shows have been eliminated, ball 18 is released from the mouth. Its diameter is somewhat greater than the diameter of ball 2. When the ball reaches the packer-preventer it settles into bushing 4. At an excess pressure of 40-50 kilograms per square centimeter screws 5 are sheared off and bushing 4 moves down to rest against bushing 12 (see Figure d). In this case the chamber of the packing element is connected to the space outside the tube by a system of openings and valves, which causes the well to be unpacked. The drilling solution, flowing around the upper and lower balls, circulates through the bottom of the drilling tool.

Technical Specifications

Dimensions, millimeters	
External Diameter	172
Length	4,500
Weight, kilograms	450
Diameter of Passage Channel, millimeters	60

TYUMEN' HIT BY MAJOR FLOOD, DANGER CONTINUES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 May 79 p 4

[Article by V. Noskov, Tyumen': "Flooding in Tyumen'"]

[Text] The warm weather that arrived in West Siberia after a long, cold winter served up a surprise to the inhabitants of Tyumen' and nearby regions. The meltwater rushed down the rivers and streams from the Ural Mountains into the Tura and Tavda rivers, turning them into raging torrents. L. A. Yanin, chief of the flood headquarters and deputy chairman of the Tyumenskaya Oblast executive committee, tells of the battle against the elements:

"You could not say we were unprepared for the flood. Based on predictions by hydrologists we were expecting that the water level in the shallow Tura and Tavda rivers would be as high as 1927. But it rose above the record level, first by 15 centimeters, then by 35 more, and it is continuing to rise.

"Industrial enterprises, schools, institutions, and residential buildings located on the outskirts of Tyumen' were threatened with flooding. The oblast headquarters for natural disasters took emergency measures. Shock detachments of workers, engineering-technical personnel, employees, and college and secondary students were formed to build up the dike.

"But the elements cannot be completely controlled. Several structures and buildings were carried away. About 3,000 Tyumenites had to be evacuated from their homes and moved to schools and trailers. The water flooded farm lands and fields readied for spring planting. Suburban communities and villages were cut off from the oblast center. They are receiving necessities by helicopter. People got their livestock to safe ground ahead of time. There have been no casualties.

"According to our calculations, the flood will not start going down for several days. Therefore, our fight against the elements is continuing. Moreover, the water level is starting to rise near Tobol'sk, Yalutorovsk, and other cities and populated points in the oblast. Preparations are going full steam there now.

"Life in Tyumen' is going forward in its usual rhythm."

DRILLING OF 6,000-METER WELL NEARS COMPLETION

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 10 Apr 79 p 1

[Article by V. Azarov, Gur'yevskaya Oblast: "Into the Earth's Interior"]

[Text] On the Manash structure between the Ural and Volga rivers V. Skuntsev's brigade from Kazneftegazrazvedka [Kazakhstan Petroleum and Gas Exploration Administration] is drilling a superdeep well. Its planned depth is 6,000 meters. The finish of long months of labor is getting closer and closer. They recently passed meter 5,950. The deeper they drill, the more difficult each meter becomes. But V. Skuntsev's brigade, one of the best in the Caspian region, is keeping on schedule.

They know how to make use of every new, progressive idea that emerges in related collectives. When S. Salmanov's drilling brigade from the Mangyshlak Petroleum and Gas Exploration Expedition switched to economic accountability and did very well, V. Skuntsev and his comrades not only moved quickly to incorporate the contract method but also challenged S. Salmanov to socialist competition.

Use of the brigade contract in exploratory drilling has worked out pretty well in drilling the superdeep well too. They were able to cut the use of materials by 25 percent and improve all the technical-economic indexes for sinking the well.

The new depths, previously unattainable by drillers, demanded a search for new techniques and materials. V. Skuntsev's brigade is using diamond bits. They have set up a monitoring post that enables them to select the optimal drilling modes at all times. They are also using a flushing liquid that contains no clay particles; it does not dirty the producing layer.

The drillers of our first superdeep well carried out another bold idea recently. They lowered one section of eight-inch stem weighing 237 tons to a depth of 4.5 kilometers.

The experience of V. Skuntsev's brigade shows that drillers can reach great depths. And this means that new paths to underground treasure will move deeper and deeper below the surface of the planet.

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BRIEFS

GAS PIPELINE CONSTRUCTION--Tallin--Construction of the last section of the Tartu-Rakvere gas pipeline has been completed in Estonia. Natural gas from Western Siberia is arriving here. It comes to the republic along the previously laid mainline in the northern part of Estonia. The second filament of the gas pipeline, joined to the first, will increase the dependability of supplying the industrial zones of the republics of the Soviet Baltic area with fuel. [Text] [Moscow IZVESTIYA in Russian 11 May 79 p 1] 6521

GAS DEVELOPMENT--Ashkhabad--Development of the 14th by count, the most remote gas field from inhabited oases -- Beurdeshikskoye -- has begun in eastern Turkmeniya. The reserve of blue fuel in it is counted at 3 billion cubic meters. The gas pipeline, the route of which is being laid here by installers of Turkmenneftegazstroy Association, is being assembled for the first time from pipes almost three times greater in diameter than ordinary. This will make it possible to accelerate many times the delivery of the fuel to the main system. At the same time, a 70-kilometer water line is being laid to Beurdeshik, located in the depths of the Zaunguzskiye Karakumy. The vital moisture of the Amu-Dar'ya River will flow through it to the heart of the desert. And on a parallel route the builders are working on a third traverse -- a motor highway, which will connect the young gas field with the already operating Kirpichlinskoye and Gazachakskoye. [Text] [Moscow IZVESTIYA in Russian 11 May 79 p 2] 6521

OIL FIELD CABLES--Uzbek electrical engineers have developed geophysical cables for operating in oblique wells. They were tested at the Tyumen' oil fields in Western Siberia. One of those who participated in development of the geophysical cables, Candidate of Physicomathematical Sciences Yakov Messenzhnik, talks about the significance of the technical innovation and about the results of testing it: "it is not simple to reach the underground storehouses of Siberia. There is severe cold in winter and marshy swamps in spring, summer and fall. Therefore, the cluster drilling method using oblique wells is employed here for mineral prospecting and operation of wells. But one unpleasantness is encountered here. The load-bearing wire armor on the cable wears out rapidly when sinking through abrasive rocks. A very interesting solution to this problem has been found at Tashkent. The wire armor has been coated with a polymer here. Long operational tests under conditions of Western Siberia showed that cables with polymer coating of the

armor are more efficient than serial cables. [Text] [Baku VYSHKA in Russian 23 May 79 p 2] 6521

COAL PRODUCTION--Concentration specialists throughout the world are working on the problem of increasing the quality of coal and of freeing it of accompanying mineral impurities. After all, both smelting of suitable steel and the efficiency of fuel combustion at electric power plants and finally the state of the air basin depend on the cleanliness of the "black gold." The Eighth International Congress on Coal Concentration, which opened on 22 May at Donetsk, was devoted to problems of developing the equipment and technology of this sector, complex utilization of coal and environmental protection. Its participants warmly accepted the greeting of Chairman of the USSR Council of Ministers A. N. Kosygin, which was made public at the opening of the congress by the minister of the coal industry of the USSR B. F. Bratchenko. The current international congress convened in the USSR, where more than 350 million tons or approximately 60 percent of the coal produced in the country is concentrated annually, is the most representative of all those held prior to this. Approximately 600 prominent scientists and specialists-producers from 28 countries are participating in it. A total of 36 reports prepared by 21 delegations will be discussed. An exhibition of equipment, means of automation of production processes and monitoring coal quality, which are produced in countries presented at the congress, was opened for the first time at this forum. The delegates and guests visit new concentration plants in the Donbass and Kuzbass, become familiar with the investigations of Soviet scientists and take excursion trips throughout the country. [Text] [Kiev PRAVDA UKRAINY in Russian 23 May 79 p 3] 6521

COAL STRIP MINING--We are at the Production Association Ekibastuzugol'. One is amazed by everything here -- the parameters of the coal basin, the scope of the socialist competition and the fact that the annual coal production per excavator brigade is numbered in seven figures. The Bogatyr' strip mine, unique in its type, is especially impressive. Ten rotary excavators with productivity from 1,000 to 5,000 tons of coal per hour each are operating here. A total of 80 tons of coal is produced here every minute. The Bogatyr' strip mine alone will produce 42.5 million tons of the most inexpensive energy fuel in the country this year. [Text] [Moscow IZVESTIYA in Russian 11 May 79 p 3] 6521

GAS PRODUCTION PROBLEMS--The Turkmen SSR Council of Ministers discussed the article "Computers Running Errands," published in IZVESTIYA (No. 9, 1979) and adopted the appropriate decision. It was indicated in the decision that along with serious work on providing fulfillment of the tasks of the 10th Five-Year Plan, the deficiencies noted in the article are also occurring in the system of the Turkmengazprom Association. The Turkmengazprom Association has been instructed to develop the structure of an automated control system corresponding to the requirements of the gas industry jointly with the Ministry of the Gas Industry within a 2-month deadline, to ensure production of the integration module and connection of it to the UVK-M-6000 in 1979 for purposes of increasing the efficiency factor of machines and for improving the quality of control of production processes, to work out measures on

organization of centralized agency check of the state of measuring equipment and to provide fulfillment of them during the current year jointly with the Turkmen Republic Administration of Gosstandart of the USSR within 1 month, not to permit disruptions of the plans for exploitation of pools; to sample the gas after detailed analysis of the current state of exploitation of the pools and corresponding coordination with the authors of the projects when the level of gas sampling varies compared to that planned, to work out measures to increase the operating reliability of the main Mayskoye-Ashkhabad-Bezmein gas pipeline and to present them in April of this year to the Turkmen SSR Council of Ministers, to adopt additional measures and to intensify control over ensuring delivery of high-quality gas to customers at Ashkhabad, Mary and Bezmein. The adopted measures are to be reported to the Trukmen SSR Council of Ministers in June 1979. [Text] [Moscow IZVESTIYA in Russian 4 May 79 p 1] 6521

OIL DRILLING EQUIPMENT--Sverdlovsk--A train left the shops of Uralmashzavod prior to the Mayday holiday -- it was loaded with first-class equipment for the Tyumen' oil workers. Highly efficient cluster drilling rigs were sent to the producers of Western Siberian resources. A total of 16 oblique wells can be sunk to a depth up to 3,000 meters from a single point by using these rigs. The height of each drilling rig is equal to a 15-storey building. The weight is 560 tons each. One thousand rail cars were required to ship the 20 units manufactured as part of the pledges for a worthy celebration of the 50th anniversary of the first five-year plan. [Text] [Moscow IZVESTIYA in Russian 27 Apr 79 p 1] 6521

GAS PIPELINE CONSTRUCTION--Tallin, 10 Apr 79--Construction of the last section of the Tartu-Rakvere gas pipeline has been completed in Estonia. Natural gas will arrive here from Western Siberia. It will be shipped to the republic along the mainline previously laid in the northern part of Estonia. [Text] [Moscow PRAVDA in Russian 11 May 79 p 2] 6521

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CASPIAN SEA, KARA-BOGAZ-GOL BAY TO BE SEPARATED BY DAM

Moscow TASS in English 1600 GMT 19 Jun 79 LD

[Text] Moscow, June 19, TASS--The Kara-Bogaz-Gol Bay, this vast saucepan on which enormous quantities of water evaporate, will be separated from the sea by a dam. The dam is being designed by Moscow engineers. At present the strait connecting the Caspian and Kara-Bogaz-Gol is 7 kilometers long and up to 200 kilometers wide. Every year the Caspian gives about 5 cubic kilometers of water to this bay. Water is irretrievably lost under the broiling sun.

This decision was taken because shallow places in the Caspian have become giant evaporators in recent years. Already now Kara-Bogaz-Gol contains more salts than water. Operating in its shores are plants producing phosphates and other minerals. The wells sunk on shore contain an especially saturated brine. Brine resources here are great enough to last for many years.

But the plentiful resources of salts have an adverse effect on the development of fishing and agriculture. Flora and fauna are inhibited and certain species of plants disappear. The problem of keeping up the Caspian's level is quite a real one. The only realistic way to preserve the sea's valuable water resources is by barring it from small lagoons and bays.

The present hydrological situation in the bay gives added urgency to the need to save the Caspian. At the eastern extremity of the bay, a waterfall has come into existence with its waters washing away native rock. If the bed of the bay grows deeper a powerful stream of water will rush from the Caspian to Kara-Bogaz-Gol to cause the further shallowing to the sea.

A huge hydraulic-fill dam is to be built to block the strait. Then a rock-filled dam will separate completely the sea and the bay.

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